APPENDIX 4 PHASE ONE ENVIRONMENTAL SITE ASSESSMENT PORTLAND CEMENT WORKS

FINAL REPORT

Phase 1 Environmental Site Assessment

Portland Cement Works

Prepared for

Blue Circle Southern Cement Pty Ltd

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June 2010

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URS

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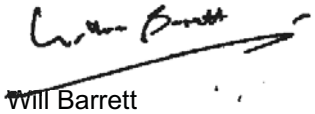

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Executive Summary

URS Australia Pty Ltd (URS) was engaged by Blue Circle Southern Cement Pty Ltd (Boral) to conduct a Phase 1 Environmental Site Assessment (Phase 1 ESA) of the former quarry and cement plant, located in the town of Portland, NSW. URS understands that the Phase 1 ESA was required as part of the proposed residential and commercial redevelopment of the site.

The Phase 1 ESA is based on a desktop review of third party, available site and historic environmental records, a site walkover reconnaissance and interviews with site representatives. Sampling of an ash stockpile located behind the residential buildings on the northern side of Williwa Street was also conducted.

The site is part of a former quarry and cement works that has been operated by Boral and predecessors since the 1800s. The site consists of a 10.5 hectare area in the southern portion of the former quarry and cement works. The site is covered by buildings, with the remaining areas consisting of paved areas, vacant land and a site screen created from ash material.

The facility originally included two boiler houses and the power house, cement kilns, crushers, storage facilities for coal, clinker and cement, a locomotive shed, workshops and offices. The plant area was served by a rail network entering from the east. Some of these buildings have now been demolished. The remaining buildings include the powerhouse building and stack, boiler house, a stores building, the bagging plant building, locomotive shed, weighbridge, main office block, bath house, casino, casualty block, a number of workshops, annex building and a group of cement silos. There is row of residential buildings along the northern side of Williwa Street, known as the Williwa Street cottages, that are owned by Boral.

The site is predominately level, with a slight slope to the north towards the quarries. The nearest identified surface water body to the site, and the destination of surface water drainage from the site and surrounding area, is Quarry 3 located directly to the north. The groundwater flow is likely to be in the same direction.

Site Activities

The site is no longer in operation, cement production having ceased in 1991 and quarrying in 1996.

Site History

The site appears to have been owned by various companies for quarrying and cement production since 1832. Cement production commenced in 1887 and continued until 1991. The production of cement commenced in 1887 and ceased in 1991.

SOIL AND GROUNDWATER CONTAMINATION ISSUES

Previous environmental investigations conducted on site, and on the quarry as a whole, have identified the presence of contamination. Ash material from the former boilers has been spread across large areas of the site and as a screen behind the residential properties along Williwa Street. Water in Quarries 1 and 2 to the north of the site contains hexavalent chromium (0.06 to 0.08 mg/L) and has a pH of up to 10. Surface soil samples collected around the residential buildings along the northern side of Williwa Street contained concentrations of some metals detected above threshold concentrations.

Coffey Geosciences Pty Ltd prepared a remediation and validation plan (RVP) in 2004 for a proposed residential subdivision of cottages on the northern side of Williwa Street. The RVP addressed concentrations of metals in the surface soil that exceeded threshold concentrations, and presented an approach and methodology for site remediation and validation.

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A limited stockpile characterisation of ash material located on the northern side of the residential buildings on Williwa Street indicated that the material contained polycyclic aromatic hydrocarbons (PAH) concentrations below the limits of reporting (LOR) and inorganics concentrations below the adopted guidelines. The analytical results were consistent with those from previous investigations of ash material generated on site.

Potential current and historical on-site sources of soil/groundwater contamination identified during the site inspection include two underground storage tanks (USTs), one above ground storage tank (AST), two (2) former oils storage sumps, a former maintenance pit, old batteries, a bunded drum storage area, one (1) current and four (4) former transformers.

Potential sources of offsite soil/groundwater contamination identified during the site inspection include the BP service station located on Williwa Street to the south of the site and the Integral Energy substation located on Saville Street to the south of the site.

Asbestos containing materials (ACM) are thought to be present in the roof of the former workshop and locomotive shed, and in the residential buildings. Polychlorinated biphenyls (PCBs) may be present in the transformer on site. Four (4) former transformers were also stored onsite in a vacant area to the west of the power house building.

OPERATIONAL COMPLIANCE & OTHER LIABILITY ISSUES

No issues were identified that have the potential to be significant non-compliance issues with respect to environmental regulatory requirements.

Introduction Section 1

1.1 Background

URS Australia Pty Ltd (URS) was engaged by Blue Circle Southern Cement Pty Ltd (Boral) to conduct a Phase 1 Environmental Site Assessment (Phase 1 ESA) of the former quarry and cement plant, located in the town of Portland, NSW (**Figure 1**). URS understands that the Phase 1 ESA is required as part of proposed residential and commercial redevelopment of the site.

The former quarry and cement plant cover an area of approximately 84 hectares. A 10.5 hectare area in the southern portion of the former quarry and cement works is the subject of this Phase 1 ESA (the site) (**Figure 2**). The site is covered by buildings, with the remaining areas consisting of paved areas, vacant land and a site screen created from ash material. The buildings consist of St Stephen's Anglican Church, church hall, residential buildings, powerhouse building and stack, boiler house, a stores building, the bagging plant building, locomotive shed, weighbridge office, main office block, bath house, casino, casualty block, a number of workshops, annex building and a group of cement silos.

The quarry was operated by Boral and predecessors since the 1800s, ceasing in 1996. The production of cement commenced in 1887 and ceased in 1991.

1.2 Objectives

The objectives of the Phase 1 ESA were to identify:

- Potential sources of soil and groundwater contamination at the site; and
- Significant non-compliance issues with environmental regulatory requirements.

Soil and groundwater contamination and significant non-compliance issues may be associated with historical or current site operations and may be the result of:

- Soil and groundwater contamination due to past and current uses of the site and surrounding land, in the context of the site's environmental setting and environmental sensitivity;
- The presence of hazardous substances on-site including redundant chemicals, asbestos and polychlorinated biphenyls (PCBs);
- Activities on and off-site which may have resulted in significant contamination by hazardous materials or wastes; and
- Current operations undertaken in potential non-compliance with environmental legislative requirements.

1.3 Scope of Work

The scope of work undertaken by URS to address the objectives consisted of the following components:

- A data review on the history of the site including a review of selected aerial photographs and Certificates of Title;
- Searches for information held by relevant State authorities in relation to contaminated land;
- Obtaining information pertaining to the site's environmental setting including the proximity of the site to sensitive receptors and information on site geology and hydrogeology;
- Inspection of the site and immediate surrounds to support the results of the data review and to identify site characteristics that may be suggestive of land contamination; and

Section 1 Introduction

- Preparation of this factual report detailing the Phase 1 ESA findings in accordance with the NSW Environment Protection Authority (EPA, now incorporated into the Department of Environment and Climate Change [DECC]) publication *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (EPA, November 1997).

Intrusive Phase 2 investigations involving material, soil or groundwater sampling were not conducted as part of this Phase 1 ESA.

1.3.1 Records Review

The following records were reviewed:

- Third Party Records:
  - Current and historical Certificates of Title to provide a history of ownership and land use;
  - Selected aerial photographs of the site from the years 1953 to 2006 to provide evidence of the history of development of the site and indications of potential sources of contamination;
  - Advice from the New South Wales Environment Protection Authority (NSW EPA), for information on notices issued by the EPA or others;
  - Planning Certificates issued under Section 149(2) & (5) of the Environmental Planning and Assessment Act 1979;
  - Details of groundwater bores registered on the Department of Natural Resources (DNR) groundwater bore database and located within 1.0 kilometre of the site; and
  - Relevant topographical and geological maps of the area.
- Site Records:
  - *Annual Environmental Management Report*, Review for 2003; and
  - *Annual Environmental Management Report*, Review for 2004.

1.3.2 Site Inspection

A site inspection was undertaken by URS on 31 October 2008 to provide further information of potential sources of soil/groundwater contamination and areas of significant environmental non-compliance.

A “drive-by” inspection of neighbouring properties was also conducted to identify the presence and proximity of sensitive receptors which could be significantly impacted upon by the site, and off-site operations which could have a significant negative impact on the site.

1.3.3 Interviews

Discussions were held by URS with Mr. David Edmiston (General Manager’s delegate for Boral Limited).

1.4 Personnel

The site visit was conducted on 31 October 2008 by Mr. Tom Onus, Environmental Scientist, URS. The site representative (Mr. David Edmiston) was present during the site inspection.

Site Description Section 2

2.1 Site Location and Ownership

The site is located in the town of Portland, NSW, as shown in **Figure 1**. It consists of a 10.5 hectare area in the southern portion of the former quarry and cement works (**Figure 2**). The site contains buildings and infrastructure related to the former quarry and cement works and residential buildings along the northern side of Williwa Street, known as the Williwa Street cottages (**Figure 3**).

A search of the Certificate of Title Search by Ausearch Pty Ltd dated 24 and 28 October 2008 identified the site as:

- part of Lot 53 in Deposited Plan (DP) 755769;
- part of Lot 1 in DP1130700;
- Lot 1 in DP109592;
- Lot 1 in DP115461 (church hall);
- Lot 1 in DP922029 (part Anglican church); and
- Lot 1 in DP923398 (part Anglican church).

The site is located at Portland, in the Local Government Area of Lithgow City, Parish of Cullen Bullen, County of Roxburgh.

The Registered Proprietors (owner) according to the current Certificates of Title are:

- Volume 1 Folio 109592 and Volume 5461 Folio 163 is Blue Circle Southern Cement Limited; and
- Volume 1 Folio 115461 and Volume 1478 Folio 45 is Anglican Church Property Trust Diocese of Sydney.

The Title also identifies a portion of land Lot 1 in DP1130700 resumed for the purposes of a pumping station pursuant to notification in Government Gazette dated 7 October 1960.

The Certificate of Title Search by Ausearch Pty Ltd is in **Appendix A**.

2.2 Planning Certificates

Planning Certificates issued under Section 149(2) & (5) of the Environmental Planning and Assessment Act 1979 by Lithgow City Council on 30 October 2008 indicates the following:

- The land is zoned as 'Zone No. 2(V) – Village' under the Lithgow City Local Environmental Plan 1994.
- The land is not affected by a policy adopted by the council that restricts the development of the land because of the likelihood of landslip, subsidence, bushfire, acid sulphate soils or any other risk.
- The land is not affected by matters arising under the Contaminated Land Management Act 1997.
- The property retains a heritage item as listed under LEP 1994.

No other information in relation to land contamination is presented in the Planning Certificate.

A copy of the Certificate is included in **Appendix B**.

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2.3 Surrounding Land Use

The site is located in the township of Portland. Adjacent properties are detailed in the following.

North	The remainder of the former quarry and cement works, including water filled quarries and vacant land, beyond which are rural residential properties.
South	Williwa Street and commercial properties, including a BP service station, cafes, bakery and pub, an oval, public swimming pool and an Integral Energy substation.
East	Residential properties and a school
West	Residential properties and the Portland Showground.

The adjacent properties were not accessed for inspection. Based on visual observation from the site the following features on the adjacent land had potential to result in contamination of the site:

- The electrical substation owned by Integral Energy; and
- The BP service station.

It should also be noted that the water contained in Quarries 1 and 2 is basic (pH ranges up to 10) and contains hexavalent chromium (URS, 2003).

2.4 Site Layout and Infrastructure

The cement works originally included two boiler houses and the power house, cement kilns, crushers, storage facilities for coal, clinker and cement, a locomotive shed, workshops and offices. The plant area was served by a rail network entering from the east. Some of these buildings have now been demolished. The remaining buildings include the powerhouse building and stack, boiler house, a stores building, the bagging plant building, locomotive shed, weighbridge, main office block, bath house, casino, casualty block, a number of workshops, annex building and a group of cement silos. A row of residential buildings owned by Boral located along the northern side of Williwa Street (the Williwa Street cottages) were included in the Phase 1 ESA.

St Stephen's Anglican Church and the adjacent church hall are located at the western end of Williwa Street. They were previously owned by Boral (or its predecessor) and were included in the Phase 1 ESA.

2.5 Site Operations and Process Description

The site is no longer in operation, having closed in 1996. Prior to its closure, the site was used by Portland Cement Works for the batching of cement.

2.6 Environmental Setting

The physical setting and environmental characteristics of the subject property are based on the URS site reconnaissance and obtained from the following sources:

- Portland Cement Works Close Plan (URS, 2008); and
- Central Mapping Authority of NSW, 1989 'Portland 8831-2-N Topographic Map 1:20,000 Second Edition'.

2.6.1 Topography and Drainage

The Central Mapping Authority of NSW gives the elevation of the site as approximately 920 metres Australian Height Datum (AHD). The site is predominately level, with a slight slope to the north towards the quarries.

2.6.2 Site Geology

The bedrock geology of the site, as described in the *NSW Geological Survey* (1962), is Devonian limestone. The limestone is an isolated block surrounded by cemented conglomerates, mudstones and shales. The boundaries are faulted to the north and south.

2.6.3 Site Hydrology

The nearest identified surface water body to the site, and the destination of surface water drainage from the site and surrounding area, is Quarry 3 is located directly to the north (**Figure 2**). The groundwater flow is likely to be in the same direction.

Other nearby surface water bodies include Quarries 1, 2 and 4, the Hot Water Dam, Williwa Creek, Dulhuntys Creek and Limestone Creek.

Quarries 1 and 2 are located to the west of the site. Quarries 3 and 4, and the Hot Water Dam are located to the north of the site.

Williwa Creek flows northwards in a valley about 1.5 kilometres further west. Dulhuntys Creek flows northwards in a parallel valley about 1.5 kilometre to the east of the site.

The Quarry and the catchment to the south, including Portland town, is drained by Limestone Creek which joins Williwa Creek about one kilometre to the north of the site. Prior to quarrying operations, it is likely that Limestone Creek drained across the centre of the site. As part of the site rehabilitation works the original drainage pattern has been re-established. Most of the storm water flow from Quarries 1 and 2 has been diverted through the site to Limestone Creek via Quarry 3.

Registered Groundwater Use

A search for registered groundwater uses located within a 1.0 kilometre radius of the site was undertaken using the NSW Government Department of Natural Resources internet database (**Appendix C**). Four (4) registered groundwater bores were registered within the area. Details of the groundwater bores are provided in **Table 2-1** below.

Table 2-1 Registered Groundwater Bores Within 1.0 km of Site

Well ID	Co-ordinate	Use	Depth (mbgl)	Yield (L/sec)	TDS (mg/L)
GW053598	33 21’ 4” 149 58’ 36”	Industrial	60	Unknown	Unknown
GW056349	33 21’ 32” 149 58’42”	Domestic	36.6	Unknown	Unknown
GW003756	33 21’ 9” 149 58’ 1”	Public/Municipal	55.2	2.37	Unknown
GW057387	33 21’ 32” 149 58’ 20”	Domestic Stock	45.7	0.13	Not known

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2.6.4 Other Sensitive Receptors

The majority of activities around the site are residential. The nearest residential properties are located adjacent to the site to the east, south and west. There is a school adjacent to the site to the east.

2.7 Site History

A review of the site history was undertaken to determine the historical use of the site, and in particular to identify activities with the potential to contaminate soil and/or groundwater at the site.

The history of the site and adjacent properties was compiled through the review of documents and information from Boral and the following sources:

- The NSW Government Department of Lands - aerial photographs;
- Ausearch Pty Ltd - historical certificates of title;
- Portland Cement Works Closure Plan 2008 prepared by URS;
- Annual Environmental Management Report, Portland Site, Review for 2003 prepared by Boral; and
- Annual Environmental Management Report, Portland Site, Review for 2004 prepared by Boral

2.7.1 Historical Aerial Photographs

Aerial photographs taken between 1953 and 2006 were obtained from the NSW Government Department of Lands. Photographs were reviewed to assess the history of development of the site. The review of the aerial photographs is summarised in **Table 2-2** below.

Table 2-2 Historical Aerial Photograph Review

Date	Register	Activity
March 1953 B&W image	Project: Bathurst Run: 4 Film: 568 Photo: 44 Scale: 1:15,500	The site includes all of the present day structures as described in Section 2.4, which the exception of the concrete silos, diesel AST and adjacent workshop. Structures no longer present on site are evident in the photograph to the north of the powerhouse and boiler house, and to the east of the main office block. Four small structures (presumed to be residential buildings) are also present on Williwa Street to the east of the church hall. The railway network entering the site from the east is present. On the Quarry site, the hot water dam and Quarries 1, 2 and 3 are evident. The surrounding area has largely been developed with residential properties.
January 1964 B&W image	Project: Bathurst Run: 8 Film: 1198 Photo: 5138 Scale: 1:17,500	The site and surrounding area are largely unchanged. Excavation of Quarry 4 has started.
November 1972 B&W image	Project: Bathurst Run: 1B Film: 2110 Photo: 5061 Scale: 1:24,500	The site and surrounding area appear to be largely unchanged. (however the aerial photograph is of low resolution). Quarries 1, 2 and 3 contain water.

Date	Register	Activity
October 1989 Colour image	Project: Bathurst Run: 10 Film: 3692 Photo: 106 Scale: 1:25,000	The cement silos and workshop appear to be present on site. The electrical substation to the south of the site is present.
July 1998 Colour image	Project: Bathurst Run: 10 Film: 1 Photo: 24 Scale: 1:25,000	The structures to the east of the main office block and most of those to the north of the powerhouse and boiler house are no longer present on site. The railway network appears to no longer be present.
March 2006 Colour image	Project: Portland Run: 3 Film: 14 Photo: 16 Scale: 1:16,000	The four residential buildings on Williwa Street, to the east of the church hall, and the remainder of the buildings to the north of the powerhouse and boiler house are no longer present. The diesel AST is present on site.

2.7.2 Historical Certificates of Title

The current and historical Certificates of Title were obtained from Ausearch Pty Ltd, and reviewed to assess the history of ownership and therefore, possible land use of the site (**Appendix A**).

The site is currently described as part of Lot 53 in Deposited Plan 755769, part of Lot 1 in DP1130700, Lot 1 in DP109592, Lot 1 in DP115461 (church hall), Lot 1 in DP922029 (part Anglican church) and Lot 1 in DP923398 (part Anglican church). The site is located at Portland, in the Local Government Area of Lithgow City, Parish of Cullen Bullen, County of Roxburgh.

The Registered Proprietors (owner) according to the current Certificates of Title are Blue Circle Southern Cement Limited and Anglican Church Property Trust Diocese of Sydney (church and church hall).

The Title also identifies a portion of land Lot 1 in DP1130700 resumed for the purposes of a pumping station pursuant to notification in Government Gazette dated 7 October 1960.

The history of the ownership based on the historical Certificates of Title is summarised in **Table 2-3**.

Table 2-3 Historical Certificates of Title

	Proprietor	Certificate of Title	Derived from Parent Title	Period of Ownership
A	The Cullen Bullen Lime and Marble Works Company Limited Later The Cullen Bullen Lime & Cement Company Limited	Vol 860 Folio 73		1887 to 1898 (B)
B	George Raffan			1898 to unknown (C)
C	The Commonwealth Portland Cement Company Limited			unknown to 1902 (D) to 1903 (G)
D	The Law Guarantee and Trust Society Limited	Vol 1411 Folio 128 Vol 1482 Folio 248	Vol 860 Folio 73	1902 to 12/9/1912 (E)
E	William Thomas Dodds and Frank Lay	Vol 1482 Folio 248		12/9/1912 to 4/3/1915 (F)

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	Proprietor	Certificate of Title	Derived from Parent Title	Period of Ownership
F	Commonwealth Portland Cement Company Limited	Vol 1482 Folio 248 Vol 2672 Folio 67 Vol 5461 Folio 163	Vol 1482 Folio 248	4/3/1915 to 6/5/1916 (G) to 12/4/1944 (H) to 6/11/1989 (K)
G	The Church of England Property Trust Diocese of Sydney and The Church of England Property Trust Diocese of Bathurst now Anglican Church Property Trust Diocese of Sydney	Vol 1473 Folio 45 Vol 2663 Folio 107	Vol 1411 Folio 128 Vol 860 Folio 73 Vol 1482 Folio 248	from 1903 from 6/5/1916 to date
H	The Commonwealth of Australia	Vol 5437 Folio 28	Vol 2672 Folio 67	12/4/1944 to 1/8/1974 (I)
I	The Commonwealth Portland Cement Company Limited			1/8/1974 to 6/11/1989 (J)
J	Blue Circle Southern Cement Limited	Vol 5437 Folio 28		6/11/1989 to date
K	Blue Circle Southern Cement Limited	Vol 5461 Folio 163		6/11/1989 to date

2.7.3 Document Review

A review of the *Portland Cement Works Closure Plan 2008* prepared by URS (2008) and the 2003 and 2004 *Annual Environmental Management Report, Portland Site* prepared by Boral has provided the following information regarding the history of the site.

Quarrying at the site began in 1832. On-site burning of limestone began in 1869 and cement was first produced in 1887. The production of cement continued until 1991. Commercial limestone quarrying ceased in 1996.

The former cement factory buildings originally included two boiler houses and the power house, cement kilns, crushers, storage facilities for coal, clinker and cement, a locomotive shed, workshops and offices. The plant area was served by a rail network entering from the east. Some of these buildings have now been demolished.

Early quarry and cement plant operations were powered by coal burning power stations situated in the cement plant area. The ash generated from the boilers was placed around the quarry and as a screen behind the residential properties along Williwa Street.

A rehabilitation programme for the site was drafted in 1995. The rehabilitation of the cement works involved the demolition and removal of the bulk of the cement making plant and the clearing of the site. Some buildings of historical significance and some other structures that have a potential for use in future commercial or residential developments were left standing.

Previous environmental investigations have been conducted at the site and the quarry as a whole, details of which are provided in Section 2.9.

2.7.4 Other Available Historical Site Information

No other historical information relating to the site was available.

2.8 EPA Contaminated Sites Database

A search of the NSW EPA (now incorporated in the DECC) public register of Notices issued under the Contaminated Land Management Act 1997 on 22 October 2008 indicated that there were no current and two (2) former notices relating to the site. Blue Circle Southern Cement Ltd was issued an Investigation Order by the EPA on 17 August 1995. A Revocation Notice was issued by the EPA on 6 October 1999.

The search results of the NSW EPA public register of Notices is included in **Appendix D**.

2.9 Previous Environmental Investigations

Previous environmental investigations conducted on site, and on the quarry as a whole, are summarised below. It should be noted that the density of soil sampling for the site as a whole, and for the factory area in particular, is low relative to current guidelines for detailed site characterisation. Consequently, additional soil sampling may become necessary if parts of the land are to be rezoned for more sensitive land uses.

Dames & Moore, 1994

The first assessment of surface water quality was conducted by Dames & Moore in 1994 and comprised a program of depth sampling in Quarries 1 and 2 and analysis for conductivity, pH and chromium. This study found that hexavalent chromium was present in the quarry waters at concentrations in the range 0.06 to 0.08 mg/L and showed no indication of vertical stratification in water salinity, pH or chromium concentrations.

Dames & Moore, 1995b

The report prepared by Dames & Moore (1995), *Ash Pile Sampling at Blue Southern Cement Portland Works*, was available in the URS library. The report details the excavation and sampling of 10 test pits in a fly ash pile on the northern side of Quarry 1 at the Portland Quarry. The works were carried out as part of on-going rehabilitation of Portland Quarry. Boral proposed to dispose of the fly ash pile into Quarries 1 and 2.

The results of organic analyses of the ash samples did not contain total petroleum hydrocarbons (TPHs) or polycyclic aromatic hydrocarbons (PAHs) above the laboratories limits of reporting (LOR). The main inorganic element in the ash was calcium, with subsidiary magnesium, potassium and sodium. Concentrations of copper, lead and zinc were elevated with respect to Australian average background levels in soil.

Dames & Moore, 1996a

Dames & Moore conducted a contamination assessment of the Portland site in 1995 in response to a Section 35 Order under the EHC Act issued by the NSW EPA. The investigation work comprised:

- A hydrographic survey and water level monitoring of the quarries;
- Sediment sampling and surface water sampling in the quarries;
- Installation of six (6) deep groundwater monitoring wells; and
- Limited soil sampling focussing on ash dumps and the former cement factory area.

Section 2 Site Description

The key conclusions of the assessment in respect of surface water were that:

- Water in Quarries 1 and 2 contained elevated concentrations of Cr(III) and Cr(VI). However, Cr(III) concentrations in all the other water bodies, including the Bottle Kiln Pond were low. A potential for periodic outflows of contaminated water from Quarries 1 and 2 through the abandoned shaft to Limestone Creek was identified; and
- Based on historical information, sources of chromium in Quarries 1 and 2 were identified as materials including chromium refractory bricks and kiln dusts disposed of at the north end of Quarry 2.

Dames & Moore excavated 10 test pits and drilled three (3) auger holes to make a preliminary assessment of soil contamination across the remainder of the site in September 1995. The test pits and auger holes were targeted in areas of potential contamination within the factory area including a waste oil store, an underground fuel storage tank and the former locomotive shed. Fly ash and kiln dust mixed with clay, gravel and rock fragments was encountered in all the test pits in the ash dump area. Coal fragments and ash occurred near the surface in all three (3) test pits excavated in the cement plant area. The soils in the auger holes appeared visually uncontaminated and no organic vapours were detected in any of the three (3) holes. Based on field screening, no soil samples were retained or analysed from the auger holes.

The soil samples were analysed for petroleum hydrocarbons, metals and asbestos. Environmental guidelines for recreational land use were not exceeded in the majority of samples. Concentrations of copper and chromium slightly exceeded the guidelines in some ash samples.

Dames & Moore drilled, installed and sampled six (6) groundwater monitoring wells on the site in 1995. The conclusions of the site groundwater assessment were that chromium and hexavalent chromium were either not detected, or otherwise detected at low concentrations in the groundwater at all locations including those in the vicinity of Quarries 1 and 2. This is assessed to be due to limited groundwater losses from Quarries 1 and 2, combined with attenuation and absorption of chromium on clays, organic matter and/or iron oxides in the aquifer. There were no indications of significant on-site or off-site groundwater contamination due to quarry activities.

Ongoing Surface Water Monitoring

Following the surface water quality investigations carried out by Dames & Moore in 1994 and 1996a, periodic monitoring of the quarries has been conducted.

Samples have generally been taken from Quarries 1, 2, 3 and 4, the hot water dam, the bottle kiln pond and the site boundary on Limestone Creek. The analytes have varied from point to point and have included pH, conductivity, trivalent chromium, hexavalent chromium, copper, lead, zinc and major ions (calcium, magnesium, potassium, chloride, sulphate and carbonate/bicarbonate). Most of the analytical results show large fluctuations in the period 1997/98. This was due to variability in the sampling procedures and laboratories and the data from that period may not be reliable.

The following surface water sampling results were available for review:

- Water Sampling in Quarries at BCSC Portland Works, Dames & Moore, 1994
- Assessment of Bottle Kiln Water Quality at Portland Quarry, Dames & Moore, 1995a
- Contamination Assessment and Conceptual Remediation Plan, Blue Circle Southern Cement Portland Works, Dames & Moore, 1996a

- May 2002 Monitoring Round of Portland Quarry, URS, 2002
- April 2003 Monitoring Round of Portland Quarry, URS, 2003
- May 2004 Monitoring Round of Portland Quarry, URS 2004
- Annual Report, Surface Water Monitoring – October 2006, HLA, 2007

Coffey 2002

Coffey Geosciences Pty Ltd conducted an ESA in 2002 for a proposed residential subdivision located at Williwa Street, Portland. The ESA was conducted in the area of residential buildings along the northern side of Williwa Street. It comprised the excavation of 15 test pits and drilling of 13 hand auger holes across the site, and analyses of the collected soil samples for a selection of metals, TPH, BTEX (comprised of benzene, toluene, ethylbenzene and xylenes), PAHs and asbestos.

Some metals were detected above the threshold concentrations (taken from the NSW EPA Auditor Guidelines). TPH, BTEX, PAHs and asbestos were not detected in the samples analysed. The report recommended that additional sampling and analysis be undertaken to assess the extent of heavy metal (particularly lead) in near surface soil and a remediation action plan (RAP) be prepared.

NBRS&P 2003

Noel Bell Ridley Smith & Partners Pty Ltd (NBRS&P) developed a conservation management plan as part of the Boral response to Conditions set by the Land and Environment Court of NSW relating to a Development Application for sub-division and development of portion of the former Portland Cement Works Site.

The conservation management plan was prepared for the cottages, fences and outbuildings located along the northern side of Williwa Street. It made seven (7) principal recommendations as to the management and proposed development of the site.

Coffey 2004

Coffey Geosciences Pty Ltd prepared a remediation and validation plan (RVP) in 2004 for a proposed residential subdivision located at Williwa Street, Portland. The RVP presented an approach and methodology for site remediation and validation.

2.10 Potential On-Site Sources of Soil/Groundwater Contamination (Current & Historical)

Potential current and historical on-site sources of soil/groundwater contamination identified during the site inspection include the following:

- Underground storage tanks (USTs) thought to be located on the southern side of the boiler house and on the northern side of the office;
- One above ground storage tank (AST) located near the workshops;
- Two former oil storage sumps in the boiler house workshop and loco shed east; and
- A bunded drum storage area located near the workshops.

Section 2 Site Description

2.11 Potential Off-Site Sources of Soil/Groundwater Contamination (Current & Historical)

Potential sources of offsite soil/groundwater contamination identified during the site inspection include the following:

- Water in Quarries 1 and 2 to the north of the site contains low concentrations of chromium and has a pH of up to 10;
- The BP service station located on Williwa Street to the south of the site; and
- The Integral Energy substation located on Saville Street to the south of the site.

Site Reconnaissance Section 3

URS conducted a visual reconnaissance of representative and readily accessible areas of the site on 31 October 2008. During the site inspection, URS spot-checked site operations and assessed compliance with environmental regulations and operating permits.

Mr. David Edmiston (General Manager's delegate for Boral Limited) was present during the site inspection activities.

3.1 Environmental Management

The site does not have an Environmental Management System to manage environmental issues. An Annual Environmental Management Report for the Portland Site was prepared by Boral for 2003. The report summarises the operations, environmental management and rehabilitation.

3.2 Permitting

The site does not currently hold any permits.

3.2.1 Dangerous Goods Notification

Dangerous goods stored and used on the site include the following:

- Engine oil – volume unknown
- Diesel - 10,000 litres (L)
- Small volumes of herbicides, chemicals for cleaning and paints

The above dangerous goods are used by Mark James, a civil contractor that rents one of the workshops and carries out site maintenance. No documentation from WorkCover relating to the storage of the above dangerous goods was made available to URS during the investigation.

The former contents and volume of the two disused USTs on-site are unknown. It is also unknown if the USTs have been decommissioned.

3.2.2 EPA Environment Protection Licensing

The facility is not operational and is therefore not required to hold any operating permits related to environmental emissions.

3.2.3 Trade Waste Agreement

The site does not hold a trade waste agreement.

3.2.4 Storage of Explosive Material

The company relinquished its license to store explosive material in 1999 following the closure of the quarry.

3.3 Air Emissions

No sources of air emissions were identified on the site.

Section 3 Site Reconnaissance

3.4 Materials Handling and Storage

3.4.1 Aboveground and Underground Storage Tanks

Diesel fuel is stored in a 10,000 L aboveground storage tank (AST) surrounded by a cement brick bund wall. The AST is located to the north of the workshops and is currently in use. The bund contained oil and water, which had stained the bund walls and floor. The oily water was leaking from the bund via an open valve and flowing across the concrete to a grassed area.

Two disused underground storage tanks (USTs) are located on site. Fill points or dip points for the USTs were located during the site inspection on the southern side of the boiler house and on the northern side of the office. No other infrastructure, such as bowsers or vents, were observed on site. The volume, age and former contents of the USTs are unknown.

The USTs remain in place and may not have been decommissioned in accordance with WorkCover dangerous goods regulations (removal of liquids and abandonment in accordance with AS 1940). Tank removal is recommended as best practice.

3.4.2 Other Chemical Use and Storage

Other significant issues associated with chemical use and storage noted during the site inspection include the following:

- Former workshop – two (2) former oil storage sumps.
- Locomotive shed – a former maintenance pit.
- Workshop – the workshop at the western end is still used by the site rehabilitation contractor. The contractor was not present during the inspection and therefore the workshop was not inspected.
- Oil and grease is kept in a locked building adjacent to the workshop. This area could not be viewed during the site inspection as the contractor was not present. It is reported that an approved contractor removes all large quantities of waste oil from the site as required.
- The bunded drum storage area located near the workshop may be contaminated. It was observed to contain eleven 205 litre oil drums and two 20 litre drums. The bund was constructed of double brick and contained black oily water which had stained the bund walls and floor. The oily water was leaking from the western side of the bund. A number of 205 litre and 20 litre oil drums were observed adjacent to the drum storage area, near the diesel AST and inside the power house building. The soil around the drums in the power house building was stained with oil.
- Approximately 20 truck and car batteries were observed adjacent to the bunded drum storage area.
- A small volume of herbicides are stored and used on site for weed control.

3.5 Water Management

3.5.1 Water Supply and Use

Water is supplied to the site from the municipal water supply system. Site representatives reported that water is used for washing and cleaning purposes, and for sanitary and domestic purposes in bathrooms and kitchen areas.

No significant issues associated with water supply or use were noted during the site assessment.

3.5.2 Wastewater Discharges

The site is not operational, and as such wastewater is not produced by the site. Prior to its closure, wastewater was recycled through the quarries.

Stormwater is directed to the stormwater drain which enters the site near the intersection of Williwa Street and Cullen Bullen Road and is thought to run to Quarry 3.

All sewerage is thought to go off-site to the Council operated sewerage treatment plant.

3.6 Waste Management

Waste generated by the tenant of the workshops is unknown as they were not present at the time of the site inspection, but is thought to include:

- General waste
- Waste oil
- Empty drums – 205 L and 20 L
- Car and truck batteries
- Scrap metal from cars, trucks and machinery
- Wire fencing

No waste is generated by Boral.

3.7 Asbestos Containing Materials

The facilities on site were constructed prior to 1986. Therefore the likelihood that the site contains asbestos containing materials (ACM) is considered high. Boral have indicated that asbestos containing materials were removed from some buildings in the early 1990s.

ACM is thought to be present in the roof of the former workshop and locomotive shed, and in the residential buildings.

This Phase 1 ESA should not be considered an asbestos survey.

3.8 Polychlorinated Biphenyls

The main item with the potential to contain polychlorinated biphenyls (PCBs) is the transformer located on-site near the intersection of Cullen Bullen Road and Williwa Street. The transformer was in good condition, with no obvious leaks or damage. The age of the transformer is unknown, however is thought to have been installed before 1992.

Four (4) former transformers were observed stored onsite in a vacant area to the west of the power house building. The transformers were open and contained oil and water. The transformer oil may contain PCBs.

3.9 Ozone Depleting Substances

Ozone depleting substances (ODS) are not considered to be an issue on the site.

Section 3 Site Reconnaissance

3.10 Radioactive Substances

The site representative reported that no radioactive materials are currently stored or used on the site.

Radioactive detectors were used onsite for mass flow and levels in the 1960s and 1970s. The site representative stated that the use of these detectors was regulated and they are not considered a significant issue.

No potential or known issues were identified with respect to radioactive substances.

3.11 Noise, Odour and Nuisance

No significant issues associated with noise, odour or nuisance were noted during the site assessment.

The Annual Environmental Management Report (Boral, 2003) indicated that no complaints were received from the Portland community during 2003.

3.12 Stockpile Sampling

A limited stockpile characterisation of ash material located on the northern side of the residential buildings on Williwa Street was carried out during the site assessment. The stockpile was estimated to be 3 metres high, 14 metres wide and 75 metres long, with a total volume of approximately 3,150 cubic metres (m^3).

Three samples of ash material (SP01, SP02 and SP03) were collected from the stockpile using a hand auger at a depth of approximately 0.3 metres below ground level (bgl). The samples were submitted to Australian Laboratory Services (ALS) in Smithfield for analyses of inorganics (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury) and polycyclic aromatic hydrocarbons (PAHs).

The analytical results of the ash samples are presented in **Table 1** and have been assessed against the health based investigation levels (HILs) published in the '*National Environment Protection (Assessment of Site Contamination) Measure' (NEPM)* (1999) as compiled by the National Environment Protection Council (NEPC). The NEPM (NEPC, 1999) health investigation levels (HILs) have been developed for a range of land use categories. For each type of land use, appropriate generic exposure scenarios and relevant generic exposure factors have been considered in developing a range of HILs.

It is understood the stockpiled ash material is to be reused on site in the proposed redevelopment plans. The analytical results have therefore been compared to the NEPM HIL-A for 'Standard' residential with garden/accessible soil and HIL-E for parks, recreational open space and playing fields.

The inorganics and PAH analytical results for the ash samples were less than the guideline concentrations from NEPM HIL-A and HIL-E. The samples contained concentrations of chromium, copper, lead, nickel and zinc above the laboratory's LOR but below the guideline concentrations. Sample SP01 had an arsenic concentration above the LOR. PAHs were not detected above the LOR in the three samples analysed.

The analytical results from this investigation are consistent with those from previous investigations of ash material on the northern side of Quarry 1 (Dames & Moore, 1995b) and at the Williwa Street Ash Dump (Dames & Moore, 1996b).

It should be noted that the number of samples collected may be less than that required to allow characterisation of the stockpile for off-site disposal or beneficial reuse onsite.

The laboratory reports are available in **Appendix E**.

Conclusions and Limitations

Section 4

URS make the following conclusions regarding the potential for land contamination at the site.

- The site is part of a former quarry that has been operated by Boral and predecessors since the 1800s. The cement plant closed in 1991. The property (quarry and cement plant) covers an area of approximately 84 hectares, approximately 10.5 hectares of which is the subject of this Phase 1 ESA. The site is covered by buildings, with the remaining areas consisting of paved areas, vacant land and a site screen created from ash material.
- The site is predominately level, with a slight slope to the north towards the quarries. The bedrock geology of the site is Devonian limestone. The nearest identified surface water body to the site, and the destination of surface water drainage from the site and surrounding area, is Quarry 3 is located directly to the north. The groundwater flow is likely to be in the same direction.
- The site appears to have been owned by various companies for quarrying and cement production since 1832. The site is currently owned by Boral and parts by the Anglican Church Property Trust Diocese of Sydney. The site is proposed to be redeveloped for a mix of residential and commercial developments and open space.
- Previous environmental investigations conducted on site, and on the quarry as a whole, have identified the presence of contamination. Ash material from the former boilers has been spread across large areas of the site and as a screen behind the residential properties along Williwa Street. Water in Quarries 1 and 2 to the north of the site contains low concentrations of chromium and has a pH of up to 10. Surface soil samples collected around the residential buildings along the northern side of Williwa Street contained concentrations of some metals were detected above threshold concentrations.
- Coffey Geosciences Pty Ltd prepared a remediation and validation plan (RVP) in 2004 for a proposed residential subdivision of the cottages on the northern side of Williwa Street. The RVP addressed concentrations of metals in the surface soil that exceeded threshold concentrations, and presented an approach and methodology for site remediation and validation.
- Potential current and historical on-site sources of soil/groundwater contamination identified during the site inspection include two (2) USTs, one (1) AST, two (2) former oils storage sumps, a former maintenance pit, old batteries, a bunded drum storage area, one (1) current and four (4) former transformers.
- Potential sources of offsite soil/groundwater contamination identified during the site inspection include the BP service station located on Williwa Street to the south of the site and the Integral Energy substation located on Saville Street to the south of the site.
- ACM is thought to be present in the roof of the former workshop and locomotive shed, and in the residential buildings. PCBs may be present in the transformers on the site.
- A limited stockpile characterisation of ash material located on the northern side of the residential buildings on Williwa Street indicated that the material contained PAH concentrations below the LOR and inorganics concentrations below the adopted guidelines. The analytical results were consistent with those from previous investigations of ash material generated on site.

Section 4 Conclusions and Limitations

This conclusion and all information in this Report are given strictly in accordance with and subject to the following limitations and recommendations:

a) The Phase 1 ESA undertaken to form this conclusion is limited to the scope of work agreed between URS and Blue Circle Southern Cement Pty Ltd as outlined in Section 1.3 ("Scope of Works") of this Report.

b) This Report has been prepared for the sole benefit of Blue Circle Southern Cement Pty Ltd (Boral) and neither the whole nor any part of this Report may be used or relied upon by any party other than Blue Circle Southern Cement Pty Ltd.

c) The investigations carried out for the purposes of the Report have been undertaken, and the Report has been prepared, in accordance with normal prudent practice and by reference to applicable environmental regulatory authority and industry standards, guidelines and assessment criteria in existence at the date of this Report.

d) This Report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by URS for use of any part of this Report in any other context.

e) This Report was prepared between 21 October 2008 and 8 June 2010 and is based on the conditions encountered on the site and information reviewed during the time of preparation. URS accepts no responsibility for any changes in site conditions or in the information reviewed that have occurred after this period of time.

f) Where this Report indicates that information has been provided to URS by third parties, URS has made no independent verification of this information except as expressly stated in the Report.

g) Given the limited Scope of Works, URS has only assessed the potential for contamination resulting from past and current known uses of the site.

h) Inspections undertaken in respect of this Report are limited to visual inspections only and are constrained by the particular site conditions, such as the location of buildings, services and vegetation.

i) No sampling or laboratory analysis has been undertaken by URS as part of this investigation. URS does not guarantee that contamination does not exist at the site.

j) Except as otherwise specifically stated in this Report, URS makes no warranty or representation as to the presence or otherwise of asbestos and/or asbestos containing materials (“ACM”) on the site. If fill has been imported onto the site at any time, or if any buildings constructed prior to 1970 have been demolished on the site or materials from such buildings disposed of on the site, the site may contain asbestos or ACM.

k) No investigations have been undertaken into any off-site conditions, or whether any adjoining sites may have been impacted by contamination or other conditions originating from this site.

l) The conclusions are based solely on the information and findings contained in this Report.

m) Except as specifically stated above, URS makes no warranty, statement or representation of any kind concerning the suitability of the site for any purpose or the permissibility of any use, development or re-development of the site.

n) Use, development or re-development of the site for any purpose may require planning and other approvals and, in some cases, environmental regulatory authority and accredited site auditor approvals. URS offers no opinion as to whether the current use has any or all approvals required, is operating in accordance with any approvals, the likelihood of obtaining any approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for additional environmental works.

o) URS makes no determination or recommendation regarding a decision to provide or not to provide financing with respect to the site.

p) The ongoing use of the site and/or use of the site for any different purpose may require the owner/user to manage and/or remediate site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this Report.

q) Any estimates for potential costs are presented as preliminary estimates only as at the date of the Report. The estimate of potential costs has been based on URS experience and judgement and, in some cases, on cost information provided by site management. Unless as otherwise expressly stated in this report, no detailed quotation has been obtained for rectification of issues and/or other actions identified in this Report. The cost estimates that have been provided may therefore vary from actual costs at the time of expenditure. Where estimates are presented as output from statistical simulations, the estimates are by definition prone to variation in line with accuracy of available information. If events do not occur as assumed, actual results may vary significantly from the current assessment. Accordingly, URS does not confirm or guarantee the achievement of the forecasts, as future events, which by their very nature are not capable of independent substantiation. Similarly, URS expressly disclaims responsibility for any changes that may occur that affect the estimates and conclusions drawn after this time. Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the planning level, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. The confidence level considered to be most appropriate for planning purposes will vary depending on the conservatism of the user and the nature of the project. The user should therefore select appropriate confidence levels to suit their particular risk profile.

References

Section 5

Blue Circle Southern Cement, *Annual Environmental Management Report, Portland Site*, Review for 2003.

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Central Mapping Authority of NSW, 1989 '*Portland 8831-2-N Topographic Map 1:20,000 Second Edition*'.

Coffey Geosciences Pty Ltd (Coffey), *Proposed Residential Subdivision, Williwa Street, Portland, Environmental Site Assessment*, 4 February 2002

Coffey Geosciences Pty Ltd (Coffey), *Remediation and Validation Plan, Lot 1 DP 109592 and Part Portion 52 Williwa Street, Portland, NSW,* 5 March 2004

Dames & Moore, *Water Sampling in Quarries at BCSC Portland Works*, June 1994

Dames & Moore, *Assessment of Bottle Kiln Water Quality at Portland Quarry*, January 1995a

Dames & Moore, *Ash Pile Sampling at Blue Circle Southern Cement Portland Works*, 21 April 1995b

Dames & Moore, *Contamination Assessment and Conceptual Remediation Plan, Blue Circle Southern Cement Portland Works*, 13 February 1996a

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Noel Bell Ridley Smith & Partners Pty Ltd (NBRS&P), *Portland Cement Works, Williwa Street Cottages and Buildings, Portland, Conservation Management Plan*, October 2003

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URS Australia Pty Ltd (URS), *April 2003 Monitoring Round of Portland Quarry*, May 2003

URS Australia Pty Ltd (URS), *May 2004 Monitoring Round of Portland Quarry*, June 2004

URS Australia Pty Ltd (URS), *Portland Cement Works Closure Plan*, 2008

Tables

Table 1
Ash Stockpile Sample Analytical Results
Phase 1 Environmental Site Assessment Portland Cement Works

Sample ID	SP01_31/10/08	SP02_31/10/08	SP03_31/10/08
Sample Date	31/10/2008	31/10/2008	31/10/2008

Analyte	Units	LOR	HIL A	HIL E			
Total Metals							
Arsenic	mg/kg	5	100	200	7	<5	<5
Cadmium	mg/kg	1	20	40	<1	<1	<1
Chromium	mg/kg	2	12%	24%	10	8	16
Copper	mg/kg	5	1000	2000	35	45	35
Lead	mg/kg	5	300	600	18	17	16
Mercury	mg/kg	0.1	15	30	<0.1	<0.1	<0.1
Nickel	mg/kg	2	600	600	11	7	9
Zinc	mg/kg	5	7000	14000	41	38	38
Polycyclic Aromatic Hydrocarbons							
Naphthalene	mg/kg	0.5			<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5			<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5	1	2	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	mg/kg	0.5			<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	mg/kg	0.5			<0.5	<0.5	<0.5
Total PAHs	mg/kg	-	20	40	-	-	-
Moisture Content							
Moisture Content (dried @ 103°C)	%	1			7.8	6.4	9.4

Notes:
LOR = limit of reporting
mg/kg = milligrams per kilogram

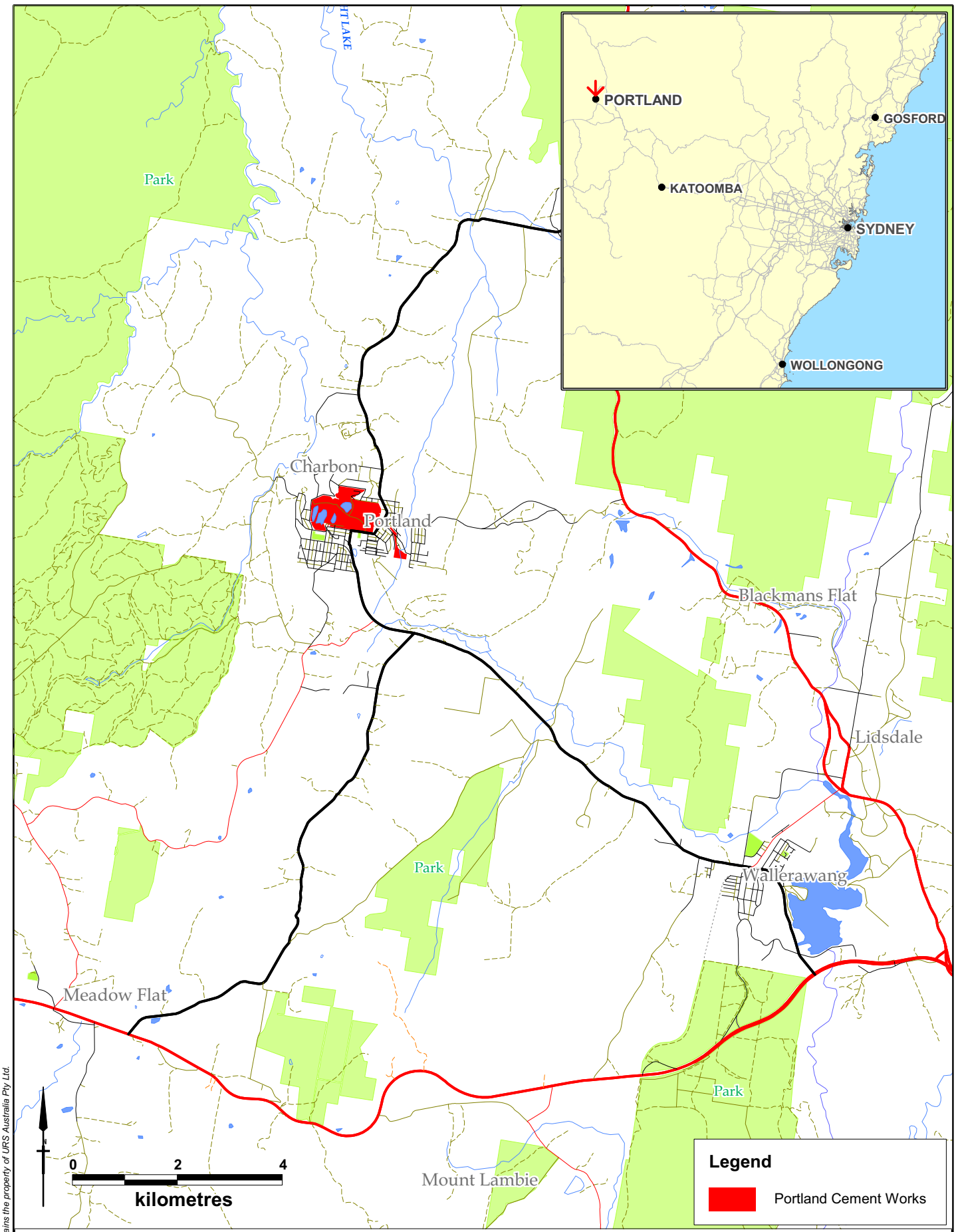
Exceeds the National Environment Protection Council 1999 Health Investigation Levels - 'A' 'Standard' residential with garden/accesible soil

Exceeds the National Environment Protection Council 1999 Health Investigation Levels - 'E' Parks, recreational open space and playing fields

Project No.: 43177139

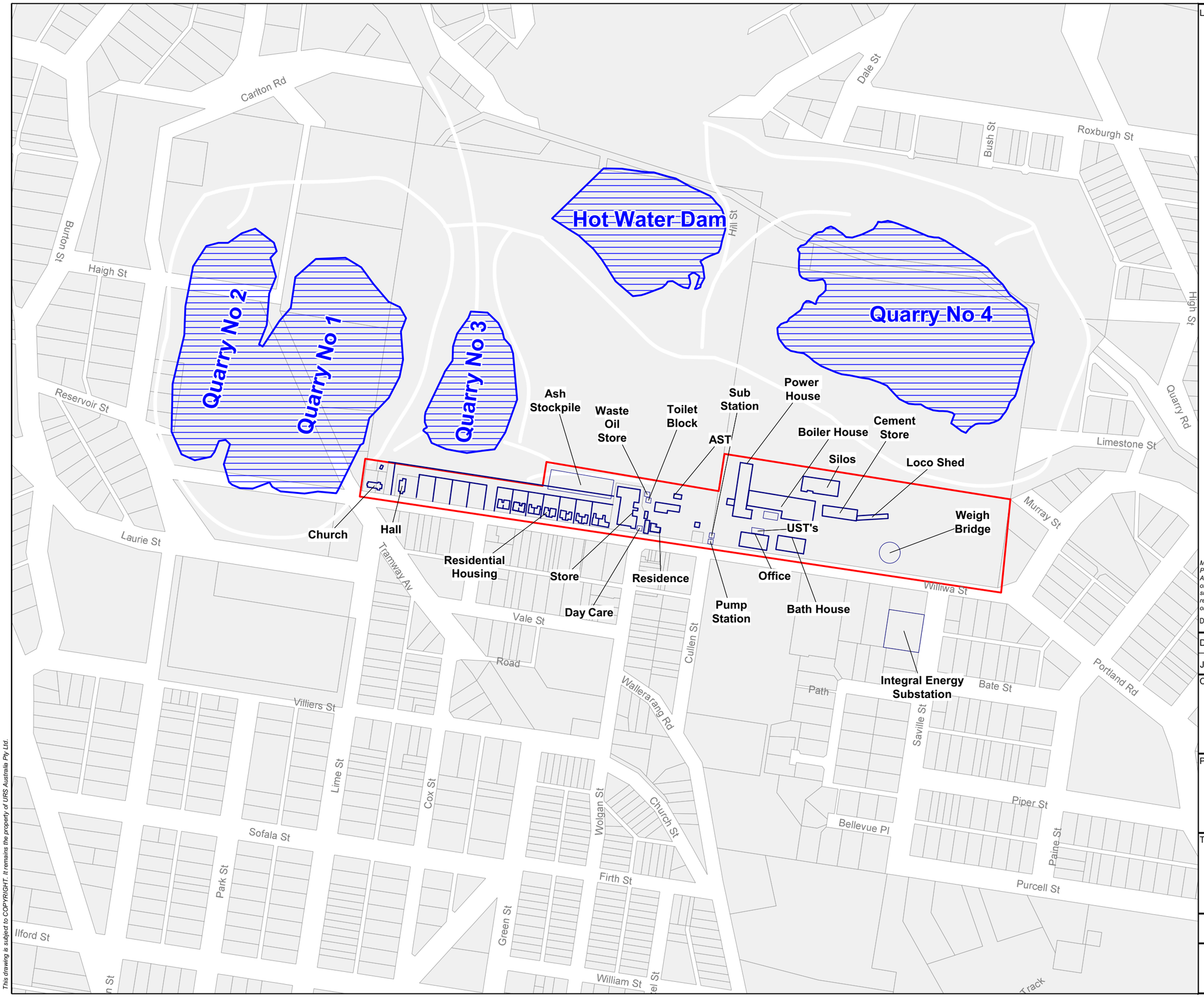
Created by: TO
Checked by: NB

Figures



Datum: GDA94, Projection: UTM, Grid: MGA Zone 55

Client	Project	Title
BLUE CIRCLE SOUTHERN CEMENT	PHASE 1 ENVIRONMENTAL SITE ASSESSMENT PORTLAND CEMENT WORKS	**SITE LOCATION**
URS	Drawn: AO | Approved: FINAL | Date: 04/06/2010	Figure: **1**
	Job No: **43177139** | File No: 43177139.016.wor	



Legend:

- Site Boundary
- Quarry

0 75 150 meters

Datum: GDA94, Projection: UTM, Grid: MGA Zone 56

Drawn: AO	Approved: NB	Date: 04/06/2010
Job No: **43177139**	File: 43177139.017.wor	

Client

BLUE CIRCLE
SOUTHERN CEMENT

Project

PHASE 1
ENVIRONMENTAL SITE ASSESSMENT –
PORTLAND CEMENT WORKS

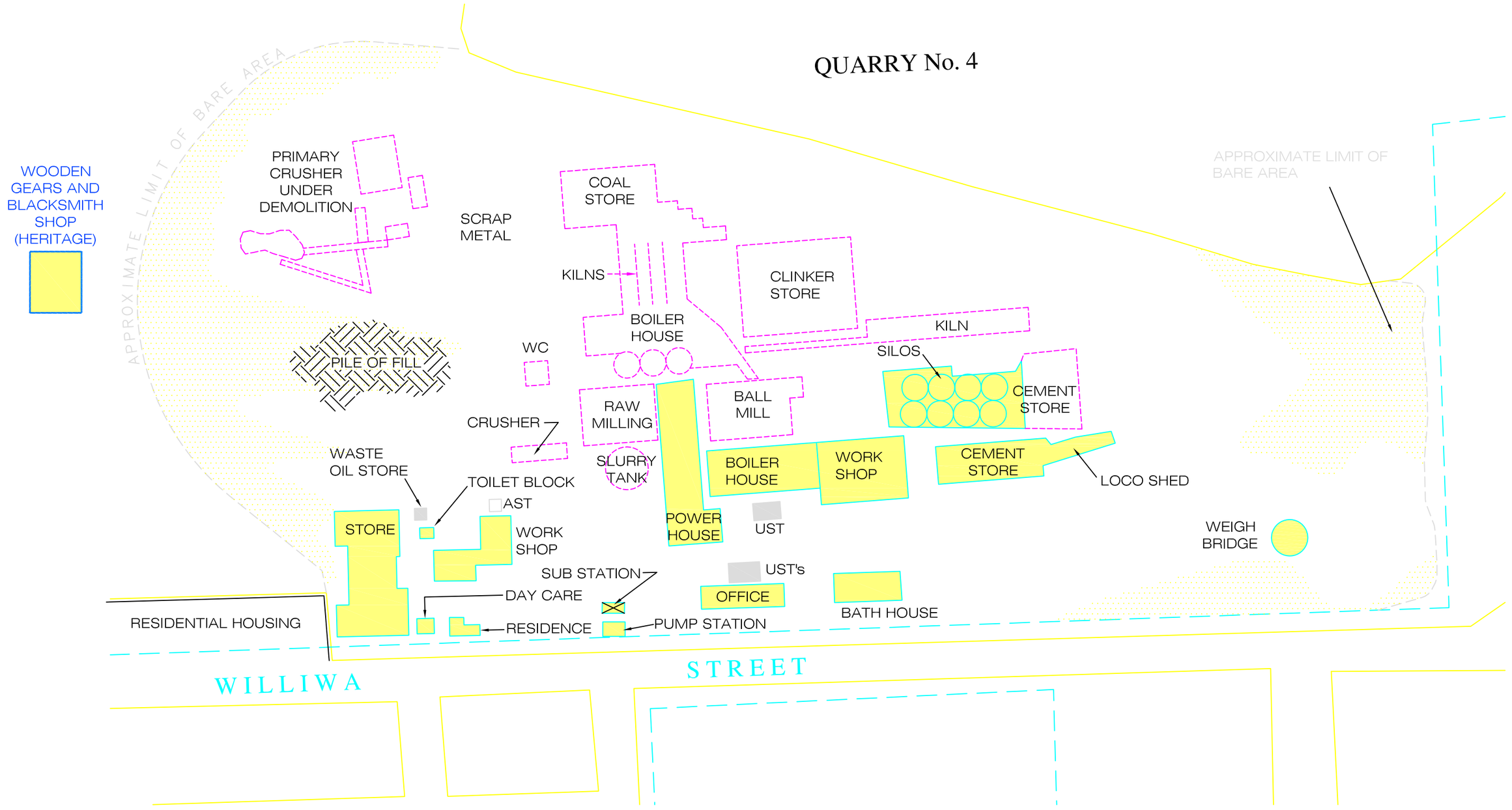
Title

SITE PLAN

Figure: **2**

URS

QUARRY No. 4



LEGEND

- Building to Remain
- Building Demolished/ Under Demolition
- Heritage Building to Remain
- Company freehold land
- TP1 Test Pit Location (1995)
- AH1 Auger Hole Location (1995)

CLIENT: **BLUE CIRCLE SOUTHERN QUARRY**				TITLE: **CEMENT WORKS BUILDINGS**	
PROJECT: **PHASE 1 ENVIRONMENTAL SITE ASSESSMENT - PORTLAND CEMENT WORKS**					A3
0 5 10 20 30 40 50 60 70 metres	DESIGNED: **MH** DRAWN: **DF/HC**	STATUS: **FINAL** DATE: **04/06/2010**	PROJECT: **43177139** CAD FILE: **010.DWG** REVISION: **A**	URS	FIGURE **3**

Titles

Appendix A

Ausearch

SEARCH RESULT

AUSEARCH PTY. LIMITED
ABN 17 002 735 195
Level 12, 75 Elizabeth Street, Sydney
PO Box A2174, Sydney South 1235
DX 315 Sydney
Email: ausearch@ausearchdirect.com.au
Web: www.ausearchdirect.com.au
Tel (02) 9230 0630 Fax (02) 9230 0640

SEARCH REPORT

The lands subject of this report are those parcels in the Local Government Area of Lithgow, Parish of Cullen Bullen and County of Roxburgh being those parts of the former Portland Cement Works, Williwa Street, Portland shown edged red on the annexed site plans.

A search of records maintained by the Office of Land and Property Information has disclosed that the subject parcel stem from and comprise parts of original Portions 52 and 53 the historic chain of title to those parcels has included

Volume 860 Folio 73
Volume 1411 Folio 128
Volume 1478 Folio 45
Volume 1482 Folio 248
Volume 2663 Folio 107
Volume 2672 Folio 67
Volume 5437 Folio 28
Volume 5461 Folio 163
Folio 1/115461
Folio Auto Consol 1478-45
Folio 1/109592
Folio Auto Consol 5461-163

Inspection of those registers has identified ownership to have been

As to the WHOLE

from circa 1887 to 1898	The Cullen Bullen Lime and Marble Works Company Limited ***later*** The Cullen Bullen Lime & Cement Company Limited
from 1898 to .....?	George Raffan
from .....? to 1902 (*orange, green & yellow*) to 1903 (*pink*)	The Commonwealth Portland Cement Company Limited

SEARCH REPORT

Continued as to the ORANGE, GREEN & YELLOW

from 1902 to 12. 9.1912	The Law Guarantee and Trust Society Limited
from 12. 9.1912 to 4. 3.1915	William Thomas Dodds and Frank Lay
from 4. 3.1915 to 5. 5.1915 (*(orange)* to 12. 4.1944 *(green)* to 6.11.1989 *(yellow)*	Commonwealth Portland Cement Company Limited

Continued as to PINK & ORANGE

from 1903 *(pink)* from 5.5.1915 *(orange)* to date	The Church of England Property Trust Diocese of Sydney *(pink)* The Church of England Property Trust Diocese of Bathurst *(orange)* ***now*** Anglican Church Property Trust Diocese of Sydney

SEARCH REPORT

Continued as to GREEN

from 12. 4.1944 to 1. 8.1974	The Commonwealth of Australia
from 1. 8.1974 to 6.11.1989	The Commonwealth Portland Cement Company Limited
from 6.11.1989 to date	Blue Circle Southern Cement Limited

Continued as to YELLOW

from 6.11.1989 to date	Blue Circle Southern Cement Limited

During the course of this search it was noted that the lands shown shaded brown on the plans catalogued as S.D.B.60/135 (including the land in plan 3724.3090) were resumed for the purposes of a pumping station pursuant to notification in Government Gazette dated 7.10.1960.

Whilst those parcels comprise parts of the land in Volume 5461 Folio 63 *(yellow),* no formal notification of that resumption has been endorsed on title. A copy of the 1960 Government Gazette is not available for copy, however it appears the resumption was made by the Minister for Public Works as Constructing Authority on behalf of the Blaxland Shire Council.

24 October, 2008

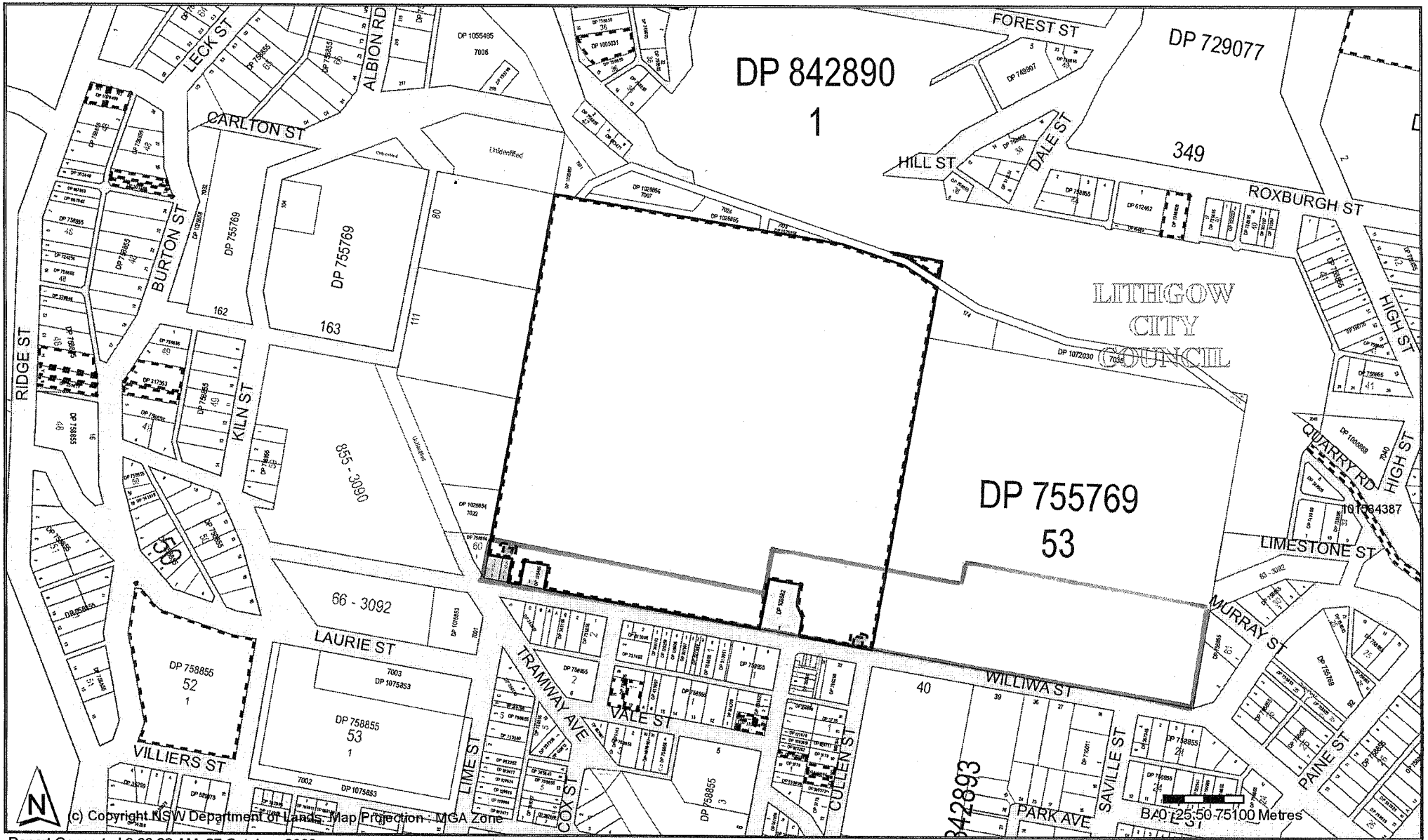
Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Ref : surv:srch-boyerp

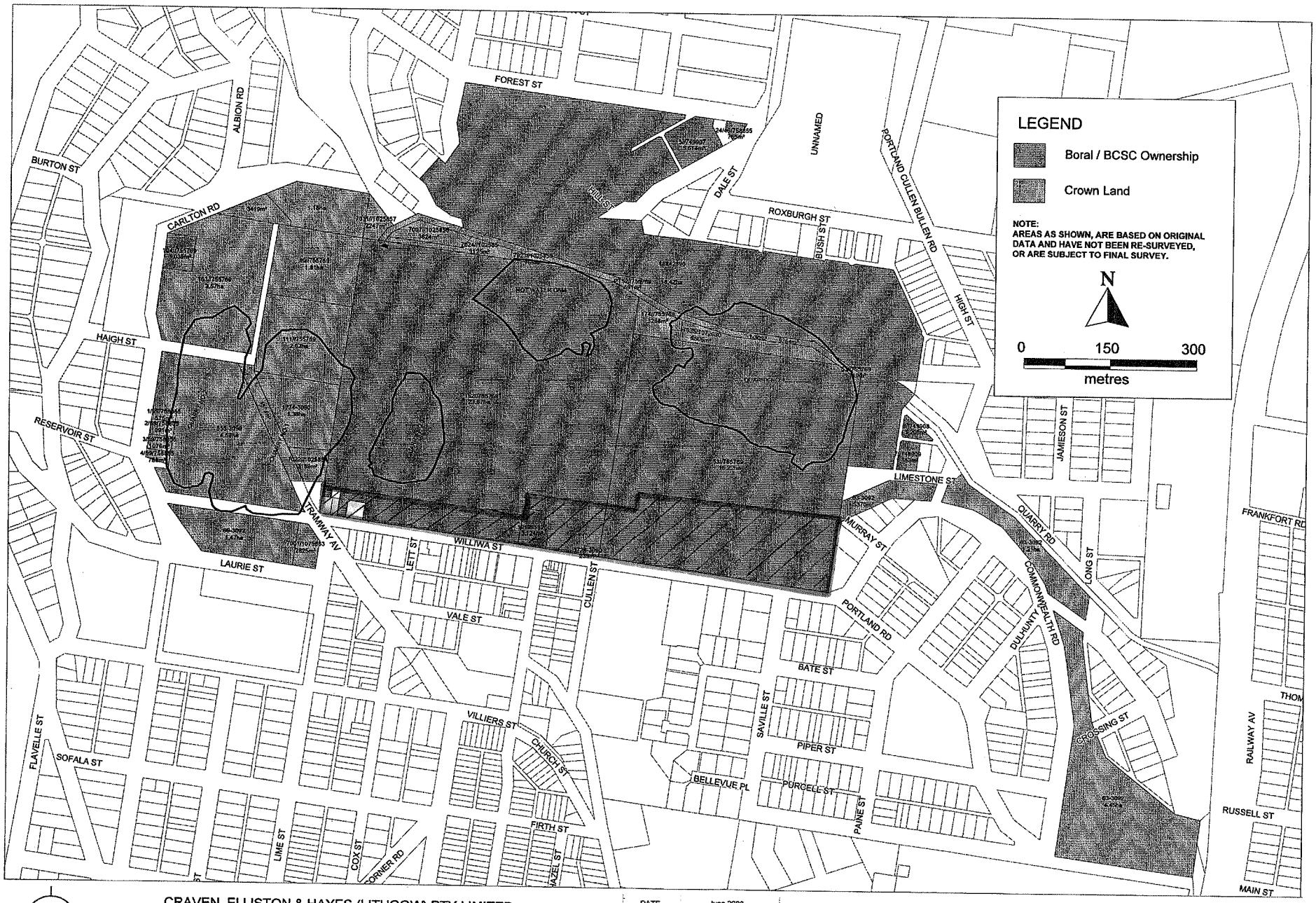
Requested Parcel : Lot 1 DP 1130700 **Identified Parcel :** Lot 1 DP 1130700

Locality : PORTLAND **LGA :** LITHGOW **Parish :** CULLEN BULLEN **County :** ROXBURGH



Report Generated 9:09:22 AM, 27 October, 2008

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.



CRAVEN, ELLISTON & HAYES (LITHGOW) PTY LIMITED
CONSULTING LAND, ENGINEERING & MINING SURVEYORS
"Astrolabe", Rutherford Lane, Lithgow NSW 2790
Phone: (02) 6351 2281 Fax: (02) 6352 1339 Email: ceh@lisp.com.au

DATE	June 2006
AMENDED	–
SURVEYOR	–
DRAWN	MATC
CHECKED	KLF

Boral/BCSC
PORTLAND SITE

OWNERSHIP

BL 907

CERTIFICATE OF TITLE.

(C.) **New South Wales.**

REGISTER BOOK,

[*Reference to last Certificates*]
[*Vol.* 602 *Folios* 241 & 242]
" 6811 " 141 & 142

VOL. 860 FOLIO 73

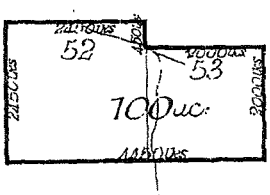
The Cullen Bullen Lime and Marble Works Company Limited Transferees under Instrument of Transfer from Alexander Adams Burnie and George Nassau numbered 128159 is now the proprietor of an Estate in Fee Simple Subject nevertheless to the reservations and conditions if any contained in the Grants hereinafter referred to and also subject to such encumbrances liens and interests as are notified hereon in That piece of Land situated in the Parish of Cullen Bullen and County of Roxburgh containing Sixty acres or thereabouts being portion 52 as originally granted to Thomas Murray by Crown Grant dated the twenty ninth day of February One thousand eight hundred and seventy six Registered in the Land Titles Office Sydney, Volume 253 Folio 220 Also in that other piece of Land situated as aforesaid containing Forty acres or thereabouts being Portion 53 originally granted as aforesaid by Crown Grant dated the Nineteenth day of June One thousand eight hundred and eighty two Registered in the said Office Volume 607 Folio 216 which said pieces of Land are shewn on the plan hereon and thereon edged red, and delineated in the Public Map of the said County deposited in the Office of the Surveyor General.

In witness whereof, I have hereunto signed my name and affixed my Seal, this [illegible] day of November one thousand eight hundred and eighty seven

Signed the 10 day of November 1887, in the presence of [illegible]

[illegible]
Deputy Registrar General.

REGISTRAR GENERAL NEW SOUTH WALES



NOTIFICATION REFERRED TO.

No. 752941 Certified Copy of Certificate by the Registrar of Companies for the Colony of New South Wales 17 June 1889 whereby The Cullen Bullen Lime & Marble Works Company Limited has changed its name to The Cullen Bullen Lime & Cement Company Limited Entered 26 June 1890 at 1/42 [illegible]

No. 756943 Special Resolution passed at an Extraordinary General meeting [illegible] September 1894 and subsequent Extraordinary General meeting dated 30 September 1895 appointing James Bathurst Liquidators of the Liquidators of the said Company Entered 26 June 1896 at 1/42 [illegible]

No 262801 TRANSFER DATED 10 March 1897
FROM THE above NAMED The Cullen Bullen Lime & Cement Company Limited (in Liquidation) to The Cullen Bullen Lime & Cement Company Limited OF THE LAND within DESCRIBED
PRODUCED & ENTERED 24 March 1897
AT 10 O'CLOCK IN THE fore NOON
REGR GENL

No MORTGAGE DATED 26 April 1897
FROM THE above NAMED The Cullen Bullen Lime & Cement Company Limited to the Commercial Banking Company of Sydney Limited
PRODUCED & ENTERED 20 April 1897
AT 11 to 12 O'CLOCK IN THE fore NOON
REGR GENL

DISCHARGE OF THE above MORTGAGE No
DATED 21st June 1898 PRODUCED &
5 July 1898 AT
O'CLOCK IN THE NOON
DEP REGR GENL

No 279579 Special Resolution passed at an extraordinary general meeting of the Cullen Bullen Lime & Cement Company Limited held on the 26th April 1898 winding up the said Company and appointing Thomas Hanley, Joseph Hindle and Alexander Adams Dennis as Liquidators of the said Company. Produced & entered 5 July 1898 at 28 mts to 12 o'clock in the afternoon

No 279580 TRANSFER DATED 23rd June 1898
FROM THE above NAMED The Cullen Bullen Lime & Cement Company Limited to George Raffan Contractor OF THE LAND within DESCRIBED
PRODUCED & ENTERED 5th July 1898
AT
REGR GENL

No 279581 MORTGAGE DATED 23rd June 1898
FROM THE above NAMED George Raffan to the Commercial Banking Company of Sydney Limited
PRODUCED & ENTERED 5th July 1898
AT
REGR GENL

DISCHARGE OF THE above MORTGAGE No 279581
DATED 14th July 1899 PRODUCED &
15th July 1899 AT 26 mts to 12
O'CLOCK IN THE fore NOON
DEP REGR GENL

No 338465 TRANSFER DATED 14 January 1902
FROM THE SAID George Raffan to The Commonwealth Portland Cement Company Limited
OF THE LAND above DESCRIBED
PRODUCED & ENTERED 15 March 1902 AT 14 mts to 12 O'CLOCK IN THE fore NOON
Dep Regr Genl

No 344 TRANSFER DATED 29 January 1902
within NAMED The Commonwealth Portland Cement Company Limited to The Law Guarantee and Trust Security Limited OF THE LAND within DESCRIBED
PRODUCED & ENTERED
AT O'CLOCK IN THE NOON
Dep Regr Genl
1411 128

PART

No TRANSFER DATED 1st April 1903
FROM THE above NAMED The Commonwealth Portland Cement Company Limited to The Church of England Property Trust Diocese of Sydney OF THE LAND within DESCRIBED
PRODUCED & ENTERED 26 June 1903
AT 10 O'CLOCK IN THE fore NOON
Cancelled & Certificate of Title issued Vol 1478 Fol 45
DEPUTY-REGISTRAR-GENERAL

(C.)

New South Wales. [CERTIFICATE OF TITLE.]

Reference to last Certificate Volume 860 folio 73

Register Book, Vol. 1411 Folio 128

The Law Guarantee and Trust Society Limited

Transferee under Instrument of Transfer from The Commonwealth Portland Cement Company Limited numbered 314137 is now the proprietor of an estate in fee simple subject nevertheless to the reservations and conditions if any contained in the Grants hereinafter referred to and also subject to such encumbrances liens and interests as are notified hereunder in That piece of land situated at Portland in the Parish of [illegible] Cullen Bullen and County of Roxburgh containing Ninety nine acres three roods eighteen perches or thereabouts Commencing on the Northern side of William Street at the South Eastern corner of Portion 53 and bounded thence on the East by the Eastern boundary of that Portion bearing Northerly Twenty chains on the North by the Northern boundary of that Portion bearing Westerly Twenty chains to Portion 52 again on the East by part of the Eastern boundary of that Portion bearing Northerly Four chains fifty links again on the North by the Northern boundary of said Portion 52 bearing Westerly Twenty four chains fifty links to Portion 50 on the West by that Portion Portion 111 and a [illegible] line bearing Southerly [illegible] Twenty two chains ninety eight and one half links on the South and again on the West by lines bearing Easterly Ninety and nine [illegible] links and Southerly One chain fifty [illegible] and one half links to William Street aforesaid and again on the South by that Street bearing Easterly Forty three chains fifty nine and one half links to the point of commencement as shown on the plan hereon and therein [illegible] being part of said Portion 52 originally granted to Thomas Murray by Crown Grant dated the twenty ninth day of February one thousand eight hundred and seventy six Registered in the Land Titles Office Sydney Volume 253 folio 280 and the whole of said Portion 53 originally granted to the said Thomas Murray by Crown Grant dated the [illegible] day of June one thousand eight hundred and eighty two Registered in the said Office Volume 607 folio 216 which said Grants are delineated in the Public Maps of the said Parish deposited in the Department of Lands. E. [illegible]

In Witness whereof I have hereunto signed my name and affixed my seal this [illegible] day of July One thousand nine hundred and [illegible]

Signed the [illegible] day of [illegible] 1903 in the presence of [illegible]

[illegible]
Deputy Registrar General

REGISTRAR GENERAL NEW SOUTH WALES

Notification referred to

Amongst the reservations and conditions contained in the Grants aforesaid are the following namely:
Reservations of minerals to [illegible]

[illegible]
Deputy Registrar General

REGISTRAR GENERAL NEW SOUTH WALES

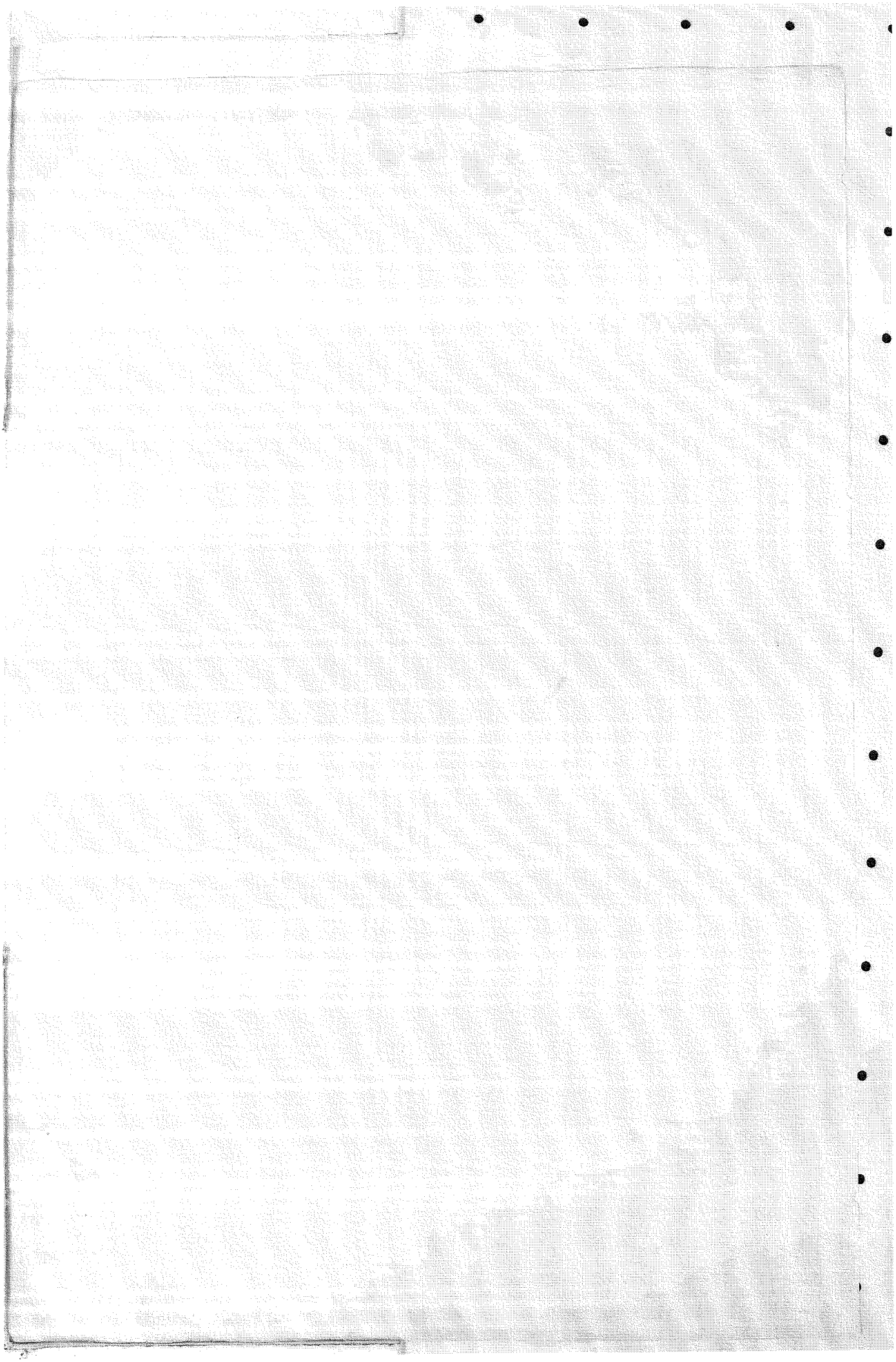
[illegible] 243 [illegible]

No. 364475 TRANSFER DATED 1st April 1903 FROM THE within NAMED The Law Guarantee and Trust Society Limited to The Church of England Property Trust Diocese of Sydney of Part of the land within DESCRIBED PRODUCED [illegible] 26th June 1903 AT [illegible] O'CLOCK IN THE [illegible]

[illegible]

PART

AUSEARCH PTY. LIMITED



1411 — 128

53

52

30

111

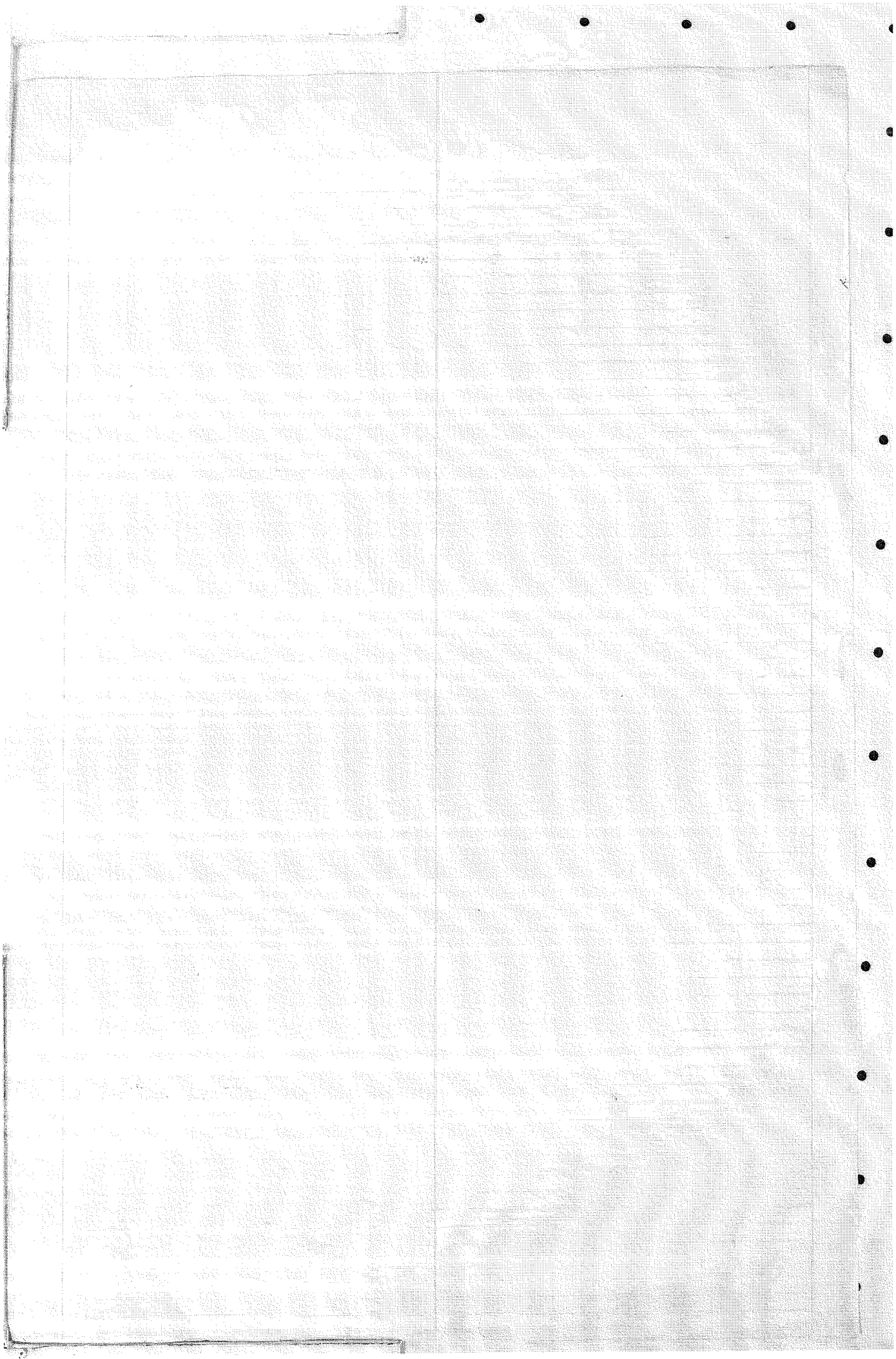
STREET

WILLIWA

ROAD ONE CHAIN WIDE

Total area included in certificate 99 3 18

All lengths shown hereon are in links



CERTIFICATE OF TITLE.

(C.) **New South Wales.**

[Appⁿ No.]
[Reference to Last Certificate]
[Vol. 860 Folio 72
1411 [illegible]]

REGISTER BOOK,
Vol. 1478 Folio 45

CANCELLED

The Church of England Property Trust Diocese of Sydney Transferee as to part under Instrument of Transfer from The Commonwealth Portland Cement Company Limited numbered 364714 and as to the other part under Instrument of Transfer from The [illegible] Guarantee and Trust Society Limited numbered 364715 is now the proprietor of an Estate in fee simple Subject nevertheless to the reservations and conditions if any contained in the Grant hereinafter referred to And also subject to such encumbrances liens and interests as are notified hereon in That piece of land situated at Portland in the Parish of Cullen Bullen and County of Roxburgh containing Thirty six and one half perches or thereabouts commencing on the Northern side of Williwa Street at its intersection with a Road one chain wide and bounded thence on the South by that Street bearing Easterly One hundred feet on the East by a line bearing Northerly one hundred feet on the North by a line bearing Westerly one hundred feet and on the West by a line bearing Southerly One hundred feet to the point of commencement as shown on the plan hereon and thereon edged red being part of portion 52 delineated on the public Map of the said parish deposited in the Department of Lands originally granted to Thomas Murray by Crown Grant dated the twenty ninth day of February One thousand eight hundred and seventy six registered in the Land Titles Office Sydney Volume 253 folio [illegible] 162

In witness whereof, I have hereunto signed my name and affixed my Seal, this Eighth day of July one thousand nine hundred and three

Signed the 8 day of July 1903, in the presence of B. [illegible]

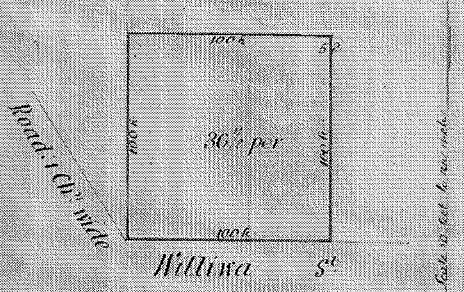
[signature]
Deputy Registrar General.

THE LAND WITHIN DESC[illegible]
LOT 1 IN DP 923398 X
LOT 1 IN DP 922029

NOTIFICATION REFERRED TO.

Amongst the reservations and conditions contained in the Grant above referred to are the following namely Reservations of Minerals &c.

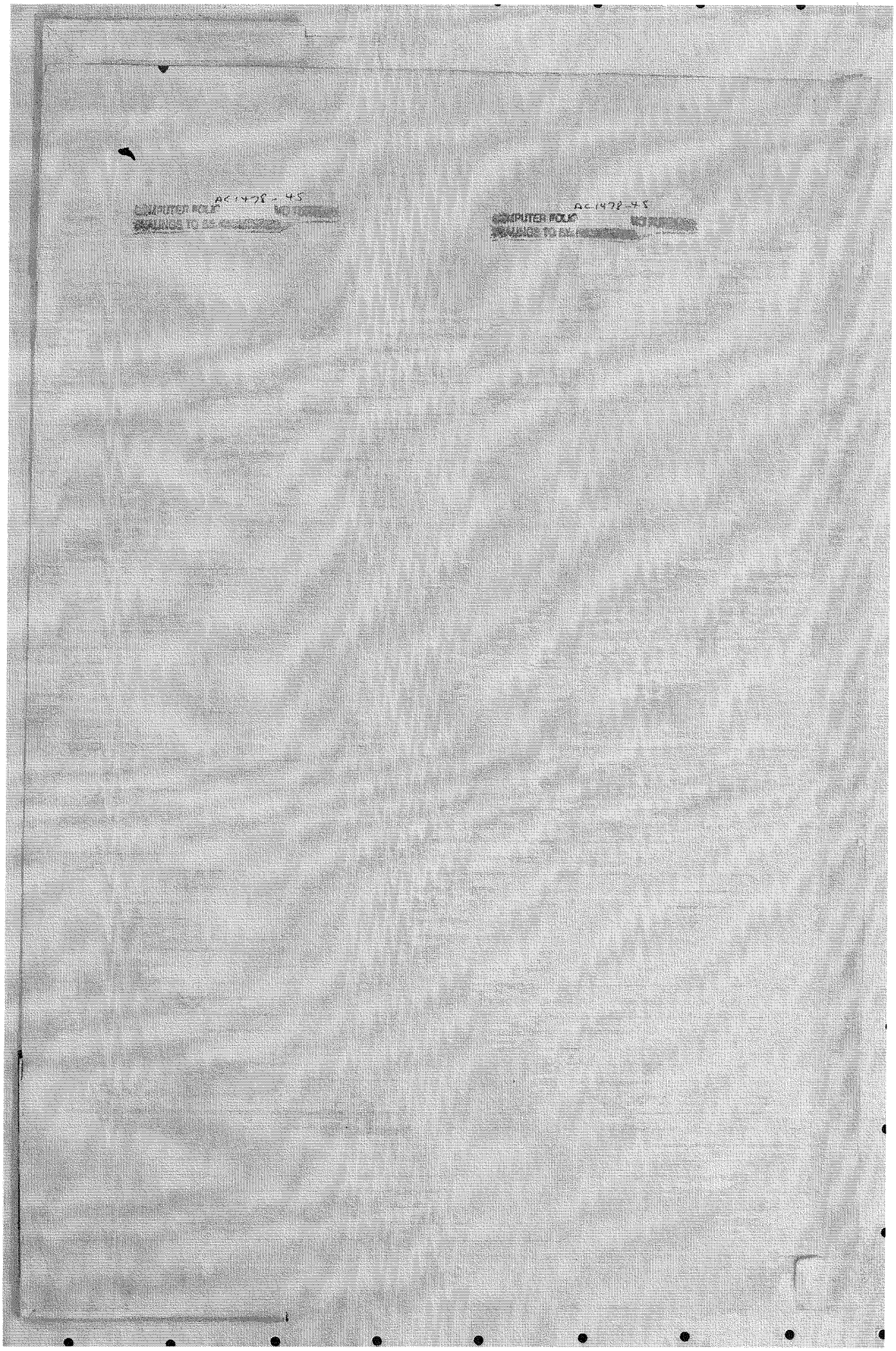
[signature]
Deputy Registrar General



REGISTERED PROPRIETOR Anglican Church Property Trust Diocese of Sydney by Change of Name 2706485. Registered 9-1-1997

AC1478-45

2706485 CNR



22819

(C.)

New South Wales.

[CERTIFICATE OF TITLE.]

Order No 11934
Reissue after transfer No 365475

Reference to last Certificate
Vol 1411 folio 128

REGISTER BOOK,
VOL. 1482 FOLIO 248

CANCELLED

W

The Law Guarantee and Trust Society Limited grantee of Certificate of Title Volume 1411 folio 128 now surrendered to be reissued after transfer numbered 365475 is now the proprietor of an Estate in fee simple Subject nevertheless to the reservations and conditions if any contained in the Grants hereinafter referred to and also subject to such encumbrances liens and interests as are notified hereunder in That piece of land situated at Portland in the Parish of Cullen Bullen and County of Roxburgh containing ninety nine acres three roods three and one half perches a [illegible] commencing on the northern side of Wallace Street at the South Eastern corner of land of The Church of England Property Trust Diocese of Sydney and bounded thence on the West by that land bearing Northerly one chain fifty one and one half links on the South by that land bearing Westerly one chain fifty one and one half links again on the West by a line [illegible] portions One hundred and eleven and eighty bearing Northerly in all twenty two chains ninety eight and one half links on the North by the Northern boundary of portion fifty two bearing Easterly twenty four chains fifty links on the East by part of the Eastern boundary of that portion bearing Southerly four chains fifty links to portion fifty three again on the North by the northern boundary of that portion bearing Easterly twenty chains again on the East by the eastern boundary of that portion bearing Southerly twenty chains to Wallace Street aforesaid and again on the South by that Street bearing Westerly forty two chains ninety eight and one half links to the point of commencement as shown on the plan hereon and therein edged red being a part of said portion 52 originally granted to Thomas Murray by Crown Grant dated the twenty ninth day of January One thousand eight hundred and seventy six registered in the Land Titles Office Sydney Volume 253 folio 220 and the whole of said portion 53 originally granted to the said Thomas Murray by Crown Grant dated the nineteenth day of June One thousand eight hundred and eighty two registered in the said Office Volume 609 folio 216

Which said Grants are delineated on the public maps of the said parish deposited in the Department of Lands

In witness whereof I have hereunto signed my name and affixed my Seal this Eighth day of August One thousand nine hundred and three

Signed the 8th day of August 1903 in the presence of
J.W. Butler

[signature]

REGISTRAR GENERAL NEW SOUTH WALES

Deputy Registrar General

Notification referred to

Amongst the reservations and conditions contained in the Grant above referred to are the following namely Reservations of Minerals

[signature]

REGISTRAR GENERAL NEW SOUTH WALES

Deputy Registrar General

No 678454 TRANSFER dated 13th August 1912 from the said The Law Guarantee Trust and Accident Society Limited To William Thomas Dodds of South Croydon Surrey England Esquire and Mark Lloyd London Esquire as Joint Tenants
Produced and entered 12th September 1912
at 12 mts pt 3 After noon.
B. R. Williams
REGISTRAR GENERAL

No 4859 Power of Attorney dated 12th September 1911 from the said The Law Guarantee Trust and Accident Society Limited to Edward Percy Simpson and Alexander Robert Minter
Produced and entered 12th September 1912
at 12 mts pt 3 After noon
B. R. Williams
REGISTRAR GENERAL

No 678455 CAVEAT dated 12th September 1912 by the Registrar General. Produced and entered 12th September 1912
at 12 mts pt 3 After noon.
B. R. Williams
REGISTRAR GENERAL

The within Caveat No. 678455
is hereby withdrawn.
Dated 4th March 1913
B. R. Williams
REGISTRAR GENERAL

No. 9574 Power of Attorney dated 13th October 1914 from the said William Thomas Dodds and Frank Lay to Edward Percy Simpson

10th February 1915

Produced and entered 4th March 1915 at 4 o'clock in the after noon

B. Williams

REGISTRAR GENERAL.

REGISTRAR GENERAL NEW SOUTH WALES

No. A 158/82 TRANSFER dated 21st December 1914 from the said William Thomas Dodds and Frank Lay to Commonwealth Portland Cement Company Limited

10th February 1915 of the land within described

Produced and entered 4th March 1915 at 4 o'clock in the after noon

B. Williams

REGISTRAR GENERAL.

REGISTRAR GENERAL NEW SOUTH WALES

No. [illegible] TRANSFER dated 5th October 1915 from the said Commonwealth Portland Cement Company Limited to The Church of England Property Trust Diocese of Bathurst [illegible] of the land within described

Produced and entered [illegible] 191[illegible] at 12 o'clock in the [illegible] noon

Cancelled & Certificate of Title issued Vol. 2665 Fol. 227

B. Williams

REGISTRAR GENERAL.

REGISTRAR GENERAL NEW SOUTH WALES

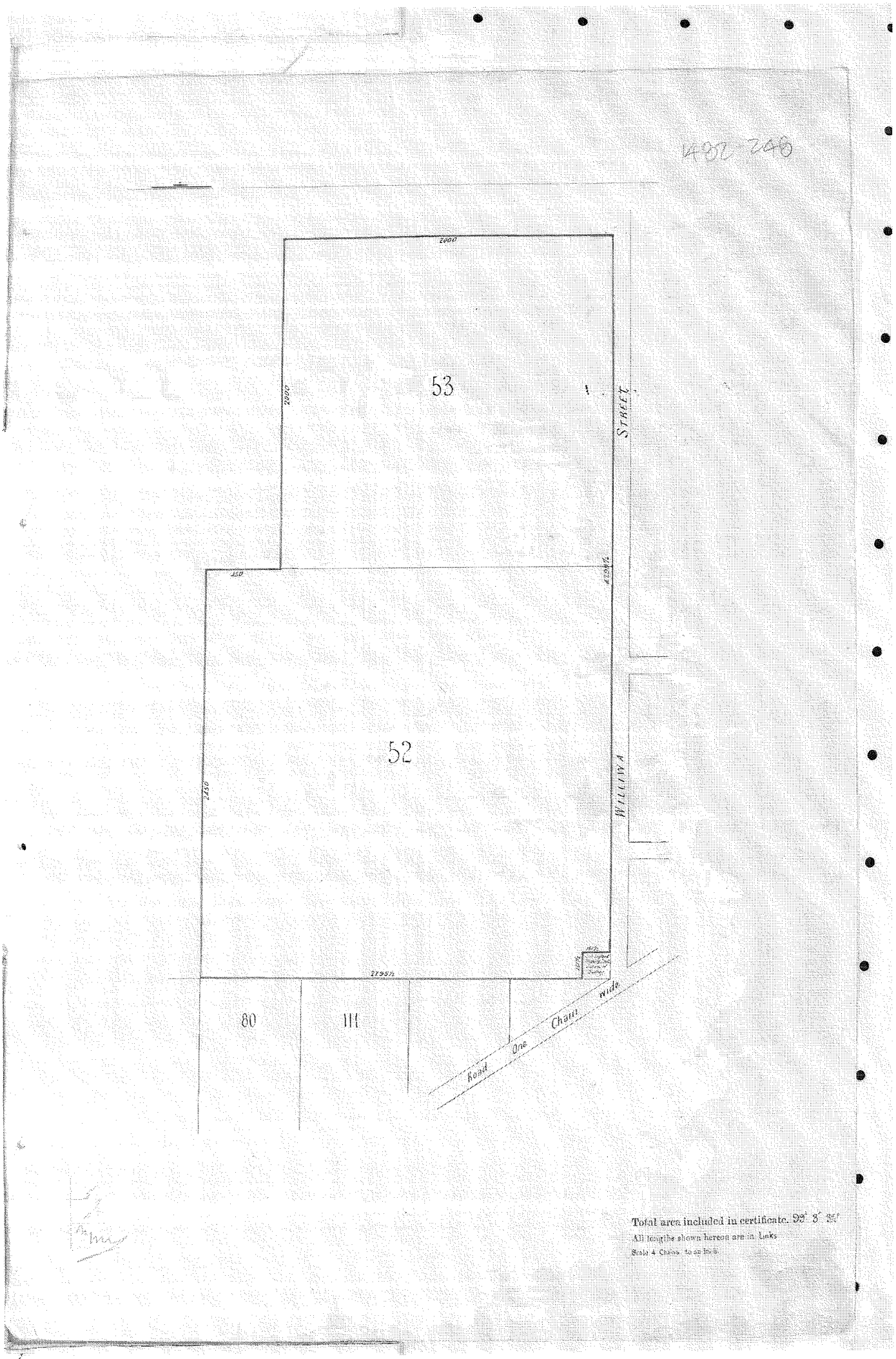
This Deed is Cancelled and Certificate of Title issued Vol. 2672 Fol. 67 [illegible]

B. Williams

Registrar General.

[illegible]

1482 248



Total area included in certificate. 99 3 3

All lengths shown hereon are in Links

Scale 4 Chains to an Inch

CERTIFICATE OF TITLE.

(C.)

New South Wales.

[Appⁿ No.]
[Reference to last Certificate]
[Vol. 1482 Folio 248]

REGISTER BOOK,
VOL. 2663 FOLIO 107

CANCELLED [W]
ON ISSUE OF NEW FOLIO 115461

Church of England Property Trust Diocese of Bathurst.

Transferee under Instrument of Transfer from The Commonwealth Portland Cement Company Limited No A 229366 is now the proprietor of an Estate in fee simple subject nevertheless to the reservations and conditions, if any, contained in the Grant hereinafter referred to, and also subject to such encumbrances, liens, and interests as are notified hereon, in That piece of land situated at Portland in the Shire of Blaxland Parish of Coulton Boulton and County of Roxburgh containing Thirty six and three quarters perches or thereabouts, as shown in the Plan hereon, and therein edged red, being part of Portion 52 delineated in the Public Map of the said Parish in the Department of Lands originally granted to Thomas Murray by Crown Grant dated the Twenty ninth day of February one thousand eight hundred and seventy six registered in the Land Titles Office Sydney Volume 263 Folio 220

In witness whereof, I have hereunto signed my name and affixed my Seal, this Sixth day of May one thousand nine hundred and Sixteen

Signed the 8 day of May 1916,
in the presence of

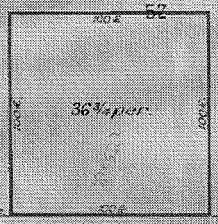
Deputy Registrar General.

THE LAND WITHIN DESCRIBED IS NOW LOT 1 IN D.P. 115461

NOTIFICATION REFERRED TO.

Amongst the reservations and conditions contained in the Grant also referred to are the following namely
Reservations of Minerals &c

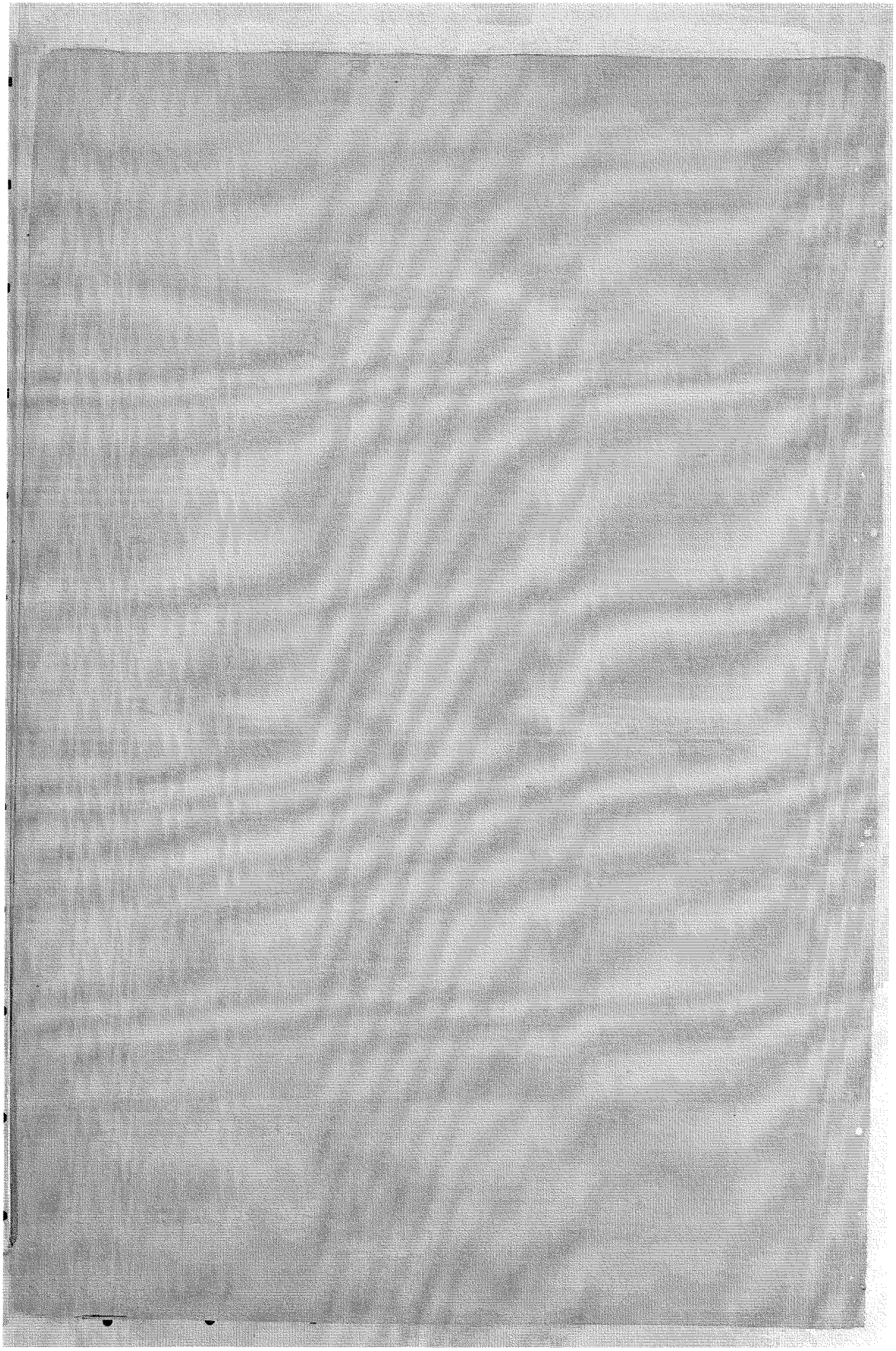
Deputy Registrar General.



SCALE - 60 FT. TO ONE INCH.

COMPLETED AND NO FURTHER DEALINGS TO BE REGISTERED.

THE LAND WITHIN DESCRIBED IS Lot 1 in DP 115461



(C.)

(Reference to Last Certificate)
(Vol. 1182 Folio 218)

New South Wales. [CERTIFICATE OF TITLE.]

(Order No A 245812)
(Residue after Transfer No A 229355)

REGISTER BOOK.
VOL. 2672 FOLIO 67

CANCELLED W

The Commonwealth Portland Cement Company Limited

by virtue of Certificate of Title Volume 1182 Folio 218 now surrendered as to Residue after Transfer No A 229355 is now the proprietor of an Estate in Fee Simple Subject nevertheless to the reservations and conditions if any contained in the Grants hereinafter referred to and also subject to such encumbrances liens and interests as are notified hereon in That piece of land situated at Portland in the Shire of Blaxland Parish of Cullen Bullen and County of Roxburgh containing Ninety nine acres two roods six and three quarters perches or thereabouts as shown in the plan hereon and therein edged red being part of Portion 52 originally granted to Thomas Murray by Crown Grant dated the twenty ninth day of February one thousand eight hundred and seventy six registered in the Land Titles Office Sydney Volume 253 Folio 220 and the whole of Portion 53 originally granted to Thomas Murray by Crown Grant dated the nineteenth day of June one thousand eight hundred and eighty two registered in the said Office Volume 607 Folio 216. Which said Grants are delineated in the public map of the said Parish in the Department of Lands

In Witness whereof I have hereunto signed my name and affixed my seal this ninth day of June One thousand nine hundred and Sixteen

Signed the 9th day of June 1916 in the presence of

A. Heere

Chas Fry
Deputy Registrar General

REGISTRAR GENERAL NEW SOUTH WALES

Notification referred to

Amongst the reservations and conditions contained in the Grants above referred to are the following namely
Reservations of minerals &c

Chas Fry
Deputy Registrar General

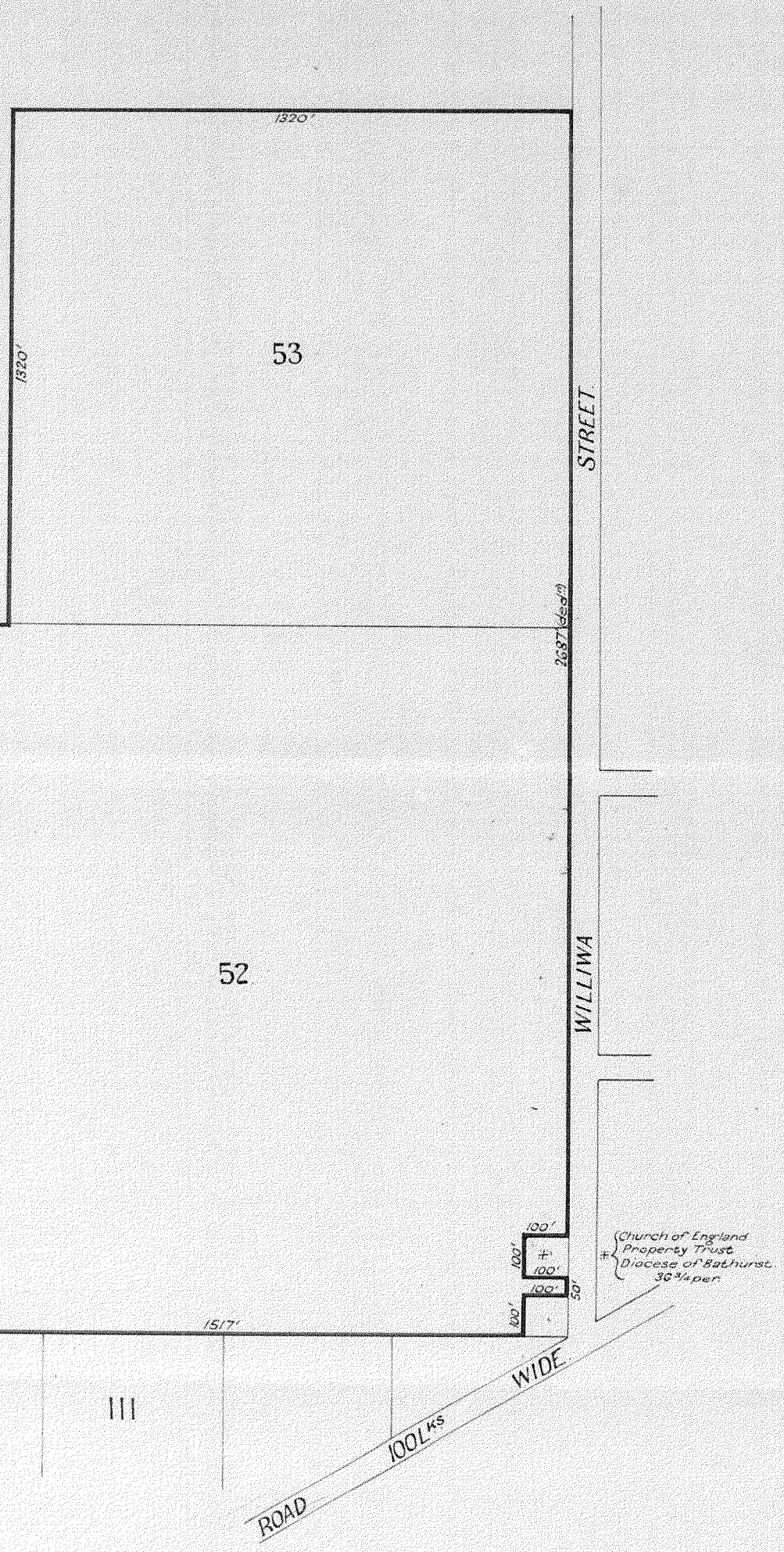
No D238609 In pursuance of Section 46A of the Real Property Act 1900 The Commonwealth of Australia as a Corporation under Section 57 of Lands Acquisition Act 1906-1936 (Commonwealth) is registered as proprietor of part of Portion 52 of the land within described
Produced 25th October 1943 and entered 12th April 1944 at 10 oclock in the forenoon

As to part in this Acquisition Certificate cancelled ... issued
5437 28

Ray W. Willis
Registrar General

This Deed is Cancelled and Certificate of Title issued
Vol. 5461 Fol 163 for residue
Ray W. Willis
O.D. 329121 Registrar General.

2672-67



1245912.

Total area included in certificate, 99a. 2r. 6¾p.

All lengths shown hereon are in feet.

Scale 300 feet to 1 inch.

183 Appn. No. _____

Reference to last certificate
Vol. 2672 Fol. 67

S
GRN

New South Wales.

87737 7.43

[CERTIFICATE OF TITLE.]

NO. D238609

REGISTER BOOK.
Vol. 5437 Fol. 28

CANCELLED W
ON ISSUE OF NEW FOLIO 1/109592

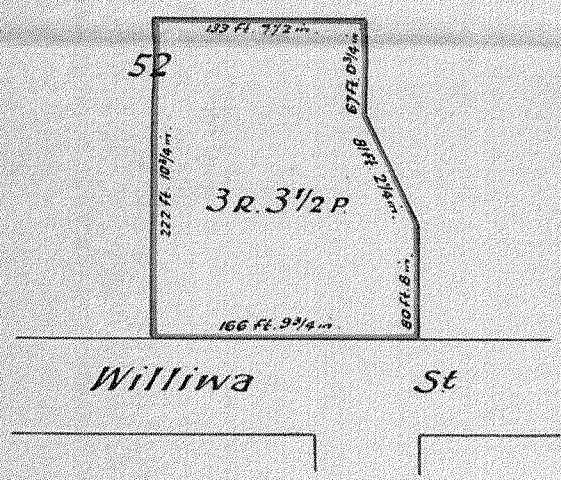
THE COMMONWEALTH OF AUSTRALIA, is now the proprietor of an Estate in Fee Simple subject nevertheless to such exceptions encumbrances liens and interests as are notified hereon in That piece of land situated at Portland in the Shire of Blaxland Parish of Cullen Bullen and County of Roxburgh containing Three roods three and one half perches or thereabouts as shown in the plan hereon and therein edged red and also shown in plan annexed to Instrument No.D238609 being part of Portion 52 originally granted to Thomas Murray by Crown Grant dated the 29th day of February 1876 Volume 253 Folio 220.

In witness whereof I have hereunto signed my name and affixed my Seal, this Twenty fifth day of July, 1944.

Signed in the presence of W.F. Friend

Registrar General.

LOT 1 ~~LAND~~ IN DP. 109592.



D 238609

Scale: 100 feet to one inch.

NOTIFICATION REFERRED TO

Exception of minerals.

Registrar General.

The Commonwealth Portland Cement Company Limited

now the registered proprietor of the land within described.

Subject to TRANSFER No. M402303 dated 10th July 1944

Entered 1st August 1944

REGISTRAR GENERAL

NO FURTHER DEALINGS TO BE REGISTERED

AUSEARCH PTY. LIMITED

201.

Appn. No.

Reference to last certificate

Vol. 2672 Fol. 67

New South Wales.

[CERTIFICATE OF TITLE.]

ORDER NO. D329121.

CANCELLED ON ISSUE OF NEW FOLIO Ac 5461-163

REGISTER BOOK.

Vol. 5461 Fol. 163

S GRM

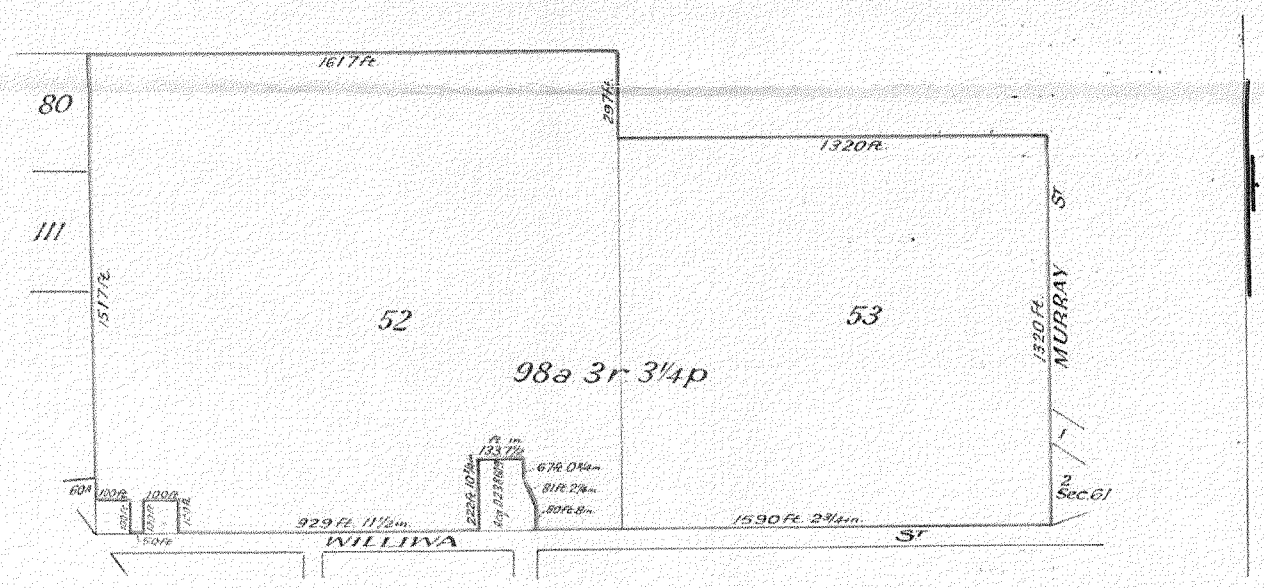
CANCELLED ON ISSUE OF NEW FOLIO

THE COMMONWEALTH PORTLAND CEMENT COMPANY LIMITED, by virtue of Certificate of Title Volume 2672 Folio 67 now surrendered is now the proprietor of an Estate in Fee Simple, subject nevertheless to the reservations and conditions, if any, contained in the Grants hereinafter referred to, and also subject to such encumbrances, liens, and interests as are notified hereon, in That piece of land situated in the Town of Portland in the Shire of Blaxland Parish of Cullen Bullen, and County of Roxburgh containing Ninety eight acres three roods three and one quarter perches or thereabouts as shown in the plan hereon and therein edged red being part of Portion 52 originally granted to Thomas Murray by Crown Grant dated the 20th day of February 1876 Volume 253 Folio 220 and the whole of Portion 53 originally granted to Thomas Murray by Crown Grant dated the 19th day of June 1882 Volume 607 Folio 216.

In witness whereof I have hereunto signed my name and affixed my Seal, this Seventh day of December 1944.

Signed in the presence of W.T. Friend

Registrar General.



Scale - 500 ft to one inch.

D329121.

NOTIFICATION REFERRED TO

Amongst the reservations and conditions contained in the Grants above referred to are reservations of minerals.

Registrar General.

No. H80799 dated 2nd November 1958

from the said The Commonwealth Portland Cement Company Limited to Bank of New South Wales

Premises known as number 58a and 58 William Street in the Town of Portland

Entered 4th November 1958.

REGISTRAR GENERAL

LEASE No. H80799 has expired by effluxion of time.

See Entered 21st October 1963.

REGISTRAR GENERAL

No. J387994 Lease dated 17th June 1963
to Bank of New South Wales of premises known as No 284 30 William Street in the Town of Portland.
Entered 21st October 1963
REGISTRAR GENERAL.
Expired V243897 27-7-1984

Y127947 Transfer ~~Granting~~ Easement for transmission Line 25 wide And variable affecting the Part of the Land Shown so burdened In DP. 640977. Registered 3-2-1989.

~~COMPUTER FOLIO ... NO FURTHER DEALINGS TO BE REGISTERED.~~

REGISTERED PROPRIETOR Blue Circle Southern Cement Limited by Transfer Y660367. Registered 6-11-1989.

9139505 Caveat by LLOYDSTOM BOYD DAVID MONCK Registered 19.12.2002.
AC64183 10/5/2006

9139505 Caveat. AA159637 Address for service of notices is Lloydstom Boyd David Monck, 1/35 Wycombe Road, Neutral Bay 2089.
AC64183 10/5/2006

9139505 CAVEAT. AB983834 ADDRESS OF SERVICE OF NOTICES IS NOW A.J. LAW & CO. SOLICITORS SUITE 22D, LEVEL 21, 185 ELIZABETH STREET SYDNEY NSW 2000. REGISTERED 16-12-2005.
AC64183 10/5/2006

FOLIO CANCELLED.
NO FURTHER DEALINGS TO BE REGISTERED.

V243897 Reg R
DP640977 R Regd Easement
Y127947 R
Y660367
9139505 + ©
AA159637 cx ©
AB983834 cx ©
AC64183 LX R

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: AUTO CONSOL 1478-45

SEARCH DATE	TIME	EDITION NO	DATE
28/10/2008	11:49 AM	-	-

VOL 1478 FOL 45 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT PORTLAND
LOCAL GOVERNMENT AREA LITHGOW CITY
PARISH OF CULLEN BULLEN COUNTY OF ROXBURGH
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

ANGLICAN CHURCH PROPERTY TRUST DIOCESE OF SYDNEY

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT 1 IN DP922029	DP922029
LOT 1 IN DP923398	DP923398.

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/115461

SEARCH DATE	TIME	EDITION NO	DATE
28/10/2008	11:40 AM	1	9/1/1997

LAND

LOT 1 IN DEPOSITED PLAN 115461
LOCAL GOVERNMENT AREA LITHGOW CITY
PARISH OF CULLEN BULLEN COUNTY OF ROXBURGH
TITLE DIAGRAM DP115461

FIRST SCHEDULE

ANGLICAN CHURCH PROPERTY TRUST DIOCESE OF SYDNEY (CN 2706485)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

NOTATIONS

NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND COMPRISED IN THIS FOLIO.
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/109592

SEARCH DATE	TIME	EDITION NO	DATE
24/10/2008	11:05 AM	1	30/10/1989

LAND

LOT 1 IN DEPOSITED PLAN 109592
LOCAL GOVERNMENT AREA LITHGOW CITY
PARISH OF CULLEN BULLEN COUNTY OF ROXBURGH
TITLE DIAGRAM DP109592

FIRST SCHEDULE

BLUE CIRCLE SOUTHERN CEMENT LIMITED (T Y660369)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS

NOTATIONS

NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND COMPRISED IN THIS FOLIO.
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

p PRINTED ON 24/10/2008

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: AUTO CONSOL 5461-163

SEARCH DATE	TIME	EDITION NO	DATE
24/10/2008	9:08 AM	-	-

VOL 5461 FOL 163 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT PORTLAND
LOCAL GOVERNMENT AREA LITHGOW CITY
PARISH OF CULLEN BULLEN COUNTY OF ROXBURGH
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

BLUE CIRCLE SOUTHERN CEMENT LIMITED

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

* 2 Y127947 EASEMENT FOR TRANSMISSION LINE 25 WIDE & VARIABLE AFFECTING THE PART OF LOT 1 IN DP1130700 SHOWN SO BURDENED IN DP640977

NOTATIONS

NOTE: RESUMPTION FOR PUMPING STATION SITE AND EASEMENTS FOR MAIN GOV GAZ 7/10/1960 FOL 3236/7. SEE CROWN PLANS 3724.3090 & 3725.3090

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT 53 IN DP755769	CROWN PLAN 332.1496
LOT 1 IN DP1130700	DP1130700.

*** END OF SEARCH ***

p

PRINTED ON 24/10/2008

DRESS ALL MAIL TO THE SECRETARY
PT. OF PUBLIC WORKS
BOX 4 SYDNEY, N.S.W.
TELEGRAPHIC ADDRESS
STATEWORKS SYDNEY

MI 2888

DEPARTMENT OF PUBLIC WORKS, N.S.W.

BRIDGE AND PHILLIP STREETS

SYDNEY, _____ 19

PLEASE QUOTE No. S.60/855. IN YOUR REPLY

TELEPHONE INQUIRIES, B 056, EXT. 2523.

The Registrar General,

SYDNEY.

SUBJECT: Blaxland Shire Council: Portland Sewerage - Land and easements proposed to be resumed.

REFERENCE: Above papers.

Gaz. 7-10-60 fo 3236/7

Herewith helio (3) illustrating the area over which action is proceeding, the notification of which will be published forthwith in the Government Gazette.

Encl.

C. E. JENKINS,
[redacted]
Actg. Secretary,
per:

Chd. on Im. Portland

MW. 23.5.60

24 MAY 1960

SB.16563

Shire of Blaxland

P.W.D.

PORTLAND SEWERAGE PLAN

showing land proposed to be acquired for Pumping Station site and site of easement proposed to be acquired for access and rising main.

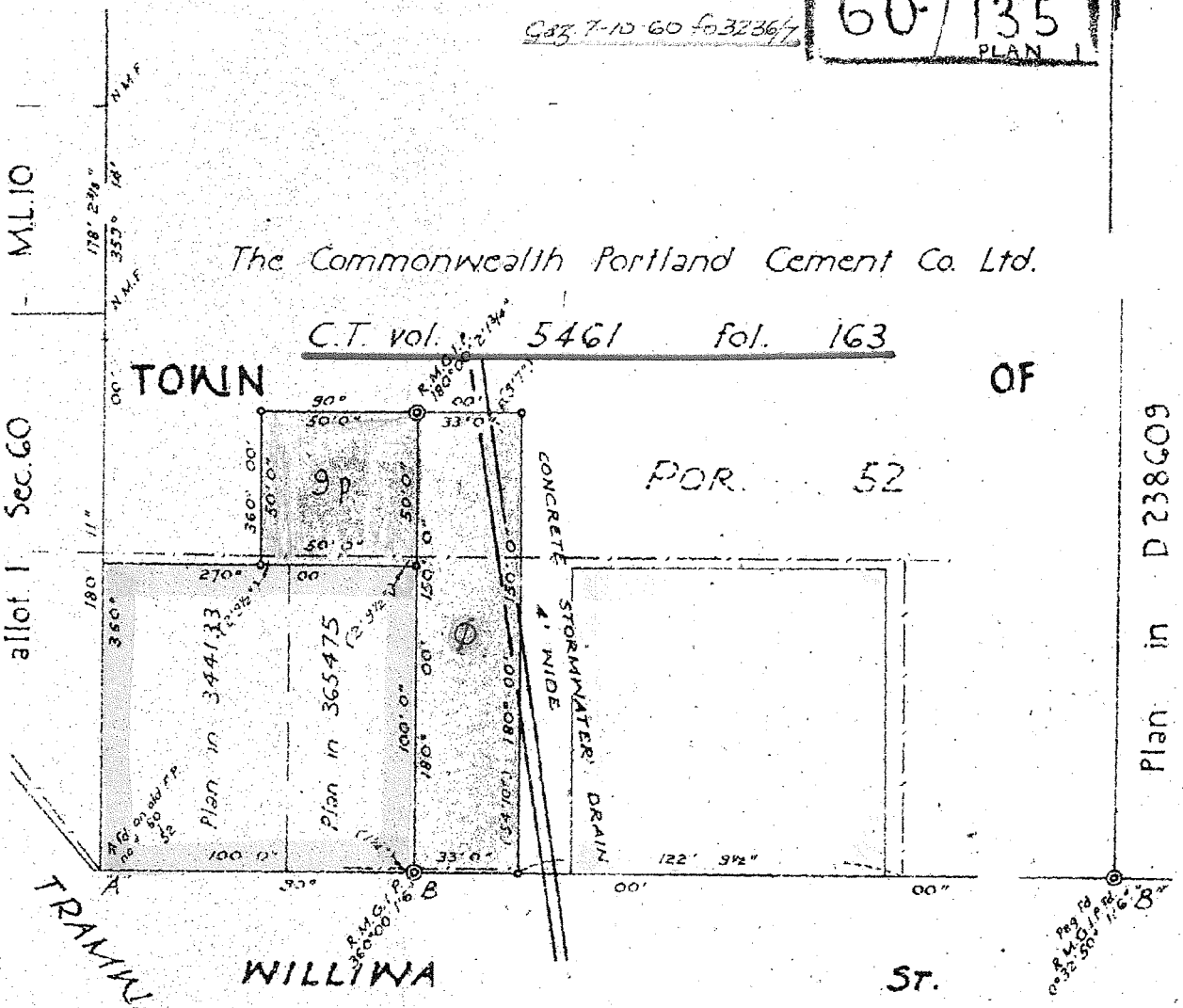
Parish of Cullen Bullen County of Roxburgh

Scale: 50 Feet to an Inch

F.B. 02207

Gaz. 7-10-60 fo 3236/7

S.D.H.
60-135
PLAN 1



Ø Proposed easement for access and rising main 33' wide.

I, Neil Hayden Druery, of Sydney, a surveyor registered under the Surveyors Act, 1929-1946, hereby certify that the survey represented in this plan is accurate and has been made under my immediate supervision in accordance with the Survey Practice Regulations, 1933 and was completed on 29th April, 1957

Azimuth taken from line A-B

N.H. Druery

Surveyor registered under the Surveyors Act, 1929-1946

SB.16563

S.P. 165/10

Shire of Blaxland

P.W.D.

PORTLAND SEWERAGE PLAN

showing site of easement proposed to be acquired for rising main

Parish of Cullen Bullen County of Roxburgh

Scale: 50 Feet to an Inch

F.B. 02207.

Gaz 7-10-60 fo 3236/7

S.M.O.H. 60/135 PLAN 2

M M

TOWN

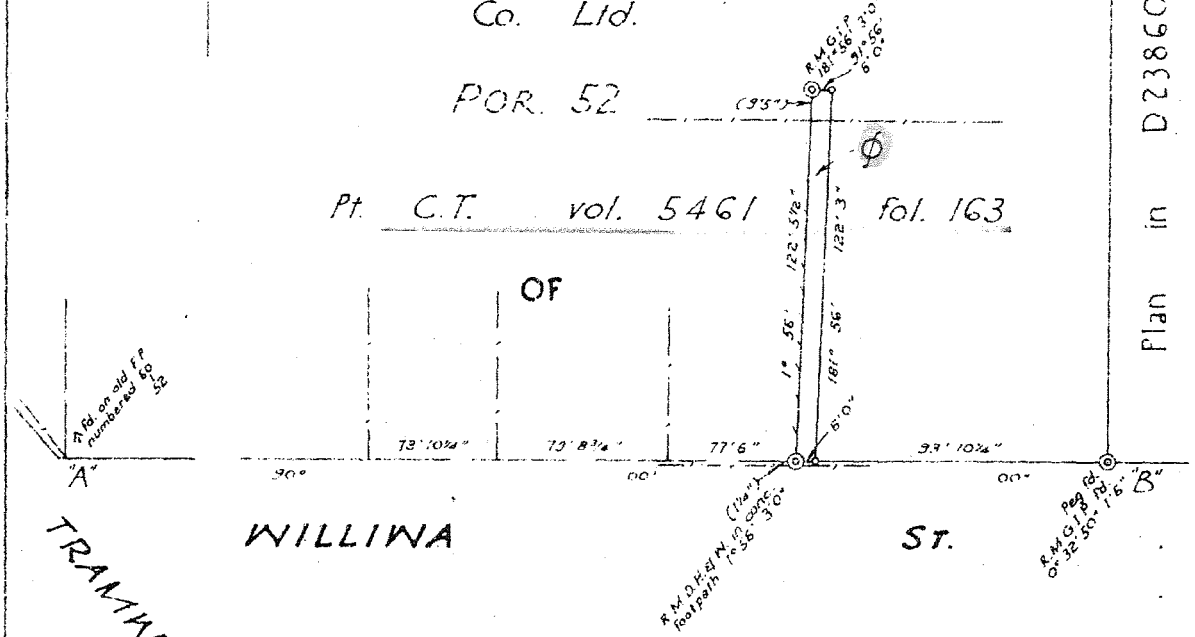
The Commonwealth Portland Cement Co. Ltd.

POR. 52

Pt. C.T. vol. 5461 fol. 163

OF

Plan in D238609



WILLIWA ST.

TRAMWAY AVE.

PORTLAND

Φ Proposed easement for rising main 6' wide

I, Neil Haydon Druery, of Sydney, a surveyor registered under the Surveyors Act, 1929-1946, hereby certify that the survey represented in this plan is accurate and has been made under my immediate supervision in accordance with the Survey Practice Regulations, 1933 and was completed on 9th April, 1957.

Azimuth taken from line A-B.

Surveyor registered under the Surveyors Act, 1929-1946

SB 165/10

Shire of Blaxland

P.W.D.

PORTLAND SEWERAGE
PLAN
showing land proposed to be acquired for Pumping Station site

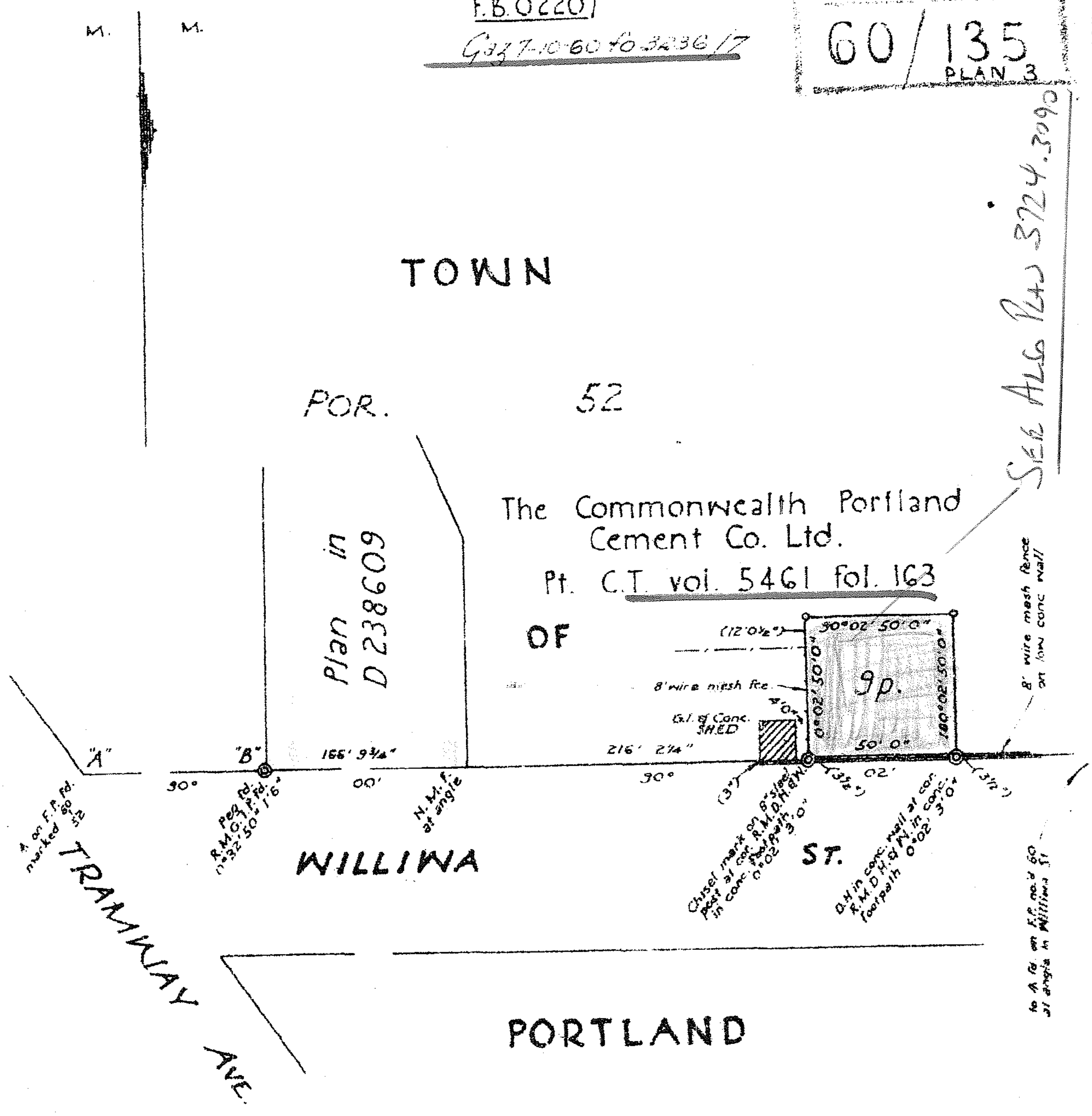
Parish of Cullen Bullen *County of Roxburgh*

Scale: 50 Feet to an Inch

F.B. 02207

G3z 7-10-60 fo 3236/7

60/135
PLAN 3



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N.H. Druery

Surveyor registered under the Surveyors Act, 1929-1946.

Azimuth taken from line A-B.

SB 16568

SB 16568

Shire of Blaxland

P.W.D.

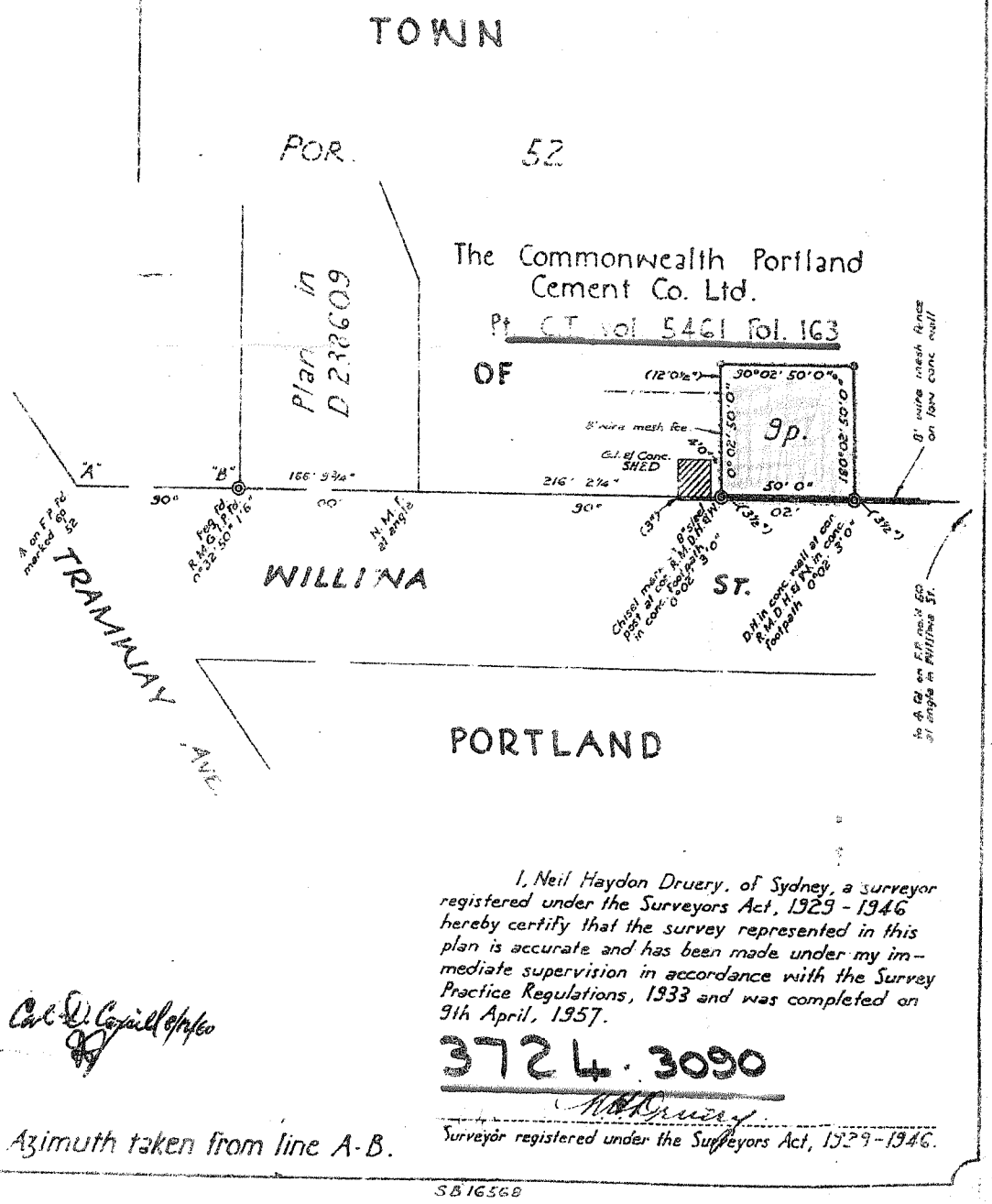
PORTLAND SEWERAGE
PLAN

showing land proposed to be acquired for Pumping Station site

Parish of Cullen Bullen County of Roxburgh

Scale : 50 Feet to an Inch

F.B. 02207



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3724.3090

N.H. Druery.

Surveyor registered under the Surveyors Act, 1929-1946.

Azimuth taken from line A-B.

SB 16568

Planning Zone Information

Appendix B

URS AUSTRALIA PTY LTD
LEVEL 3 116 MILLER STREET
NORTH SYDNEY NSW 2060

PLANNING CERTIFICATE UNDER SECTION 149, ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

CERTIFICATE NO: 149(5)-08-0074

YOUR REF: 43177139.10400
RECEIPT NO: 185673

PROPERTY NO: 101674
ISSUE DATE: 30/10/2008

PROPERTY ADDRESS: WILLIWA STREET PORTLAND NSW 2847
OWNER: BLUE CIRCLE SOUTHERN CEMENTLIMITED

LAND PARCEL DESCRIPTIONS: Part Lot 52 DP 755769
Lot 53 DP 755769

IN ACCORDANCE WITH SECTION 149(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979, IT IS CERTIFIED THAT AT THE DATE OF THIS CERTIFICATE THE FOLLOWING PRESCRIBED MATTERS RELATE TO THE LAND:

LITHGOW CITY LOCAL ENVIRONMENTAL PLAN 1994

GENERAL EFFECT OF PLANNING INSTRUMENT ON THE ABOVEMENTIONED LAND AND DETAILS OF THOSE PURPOSES FOR WHICH DEVELOPMENT MAY OR MAY NOT BE UNDERTAKEN WITHIN THIS ZONE:

Zone: 2(V) Village - L.E.P. 1994

Zone objectives and development control:

Set out below for the zone are:
(a) the objectives of the zone;
(b) the development that may be carried out without development consent;
(c) the development that may be carried out only with development consent; and
(d) the development that is prohibited.

In addition to the controls contained in LEP 1994, Clause 29 of the Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 sets out further circumstances where development consent will be required for particular development. These circumstances may include development that does not require consent under LEP 1994. A copy of Clause 29 is attached (Annexure "B").

The Council must not grant consent to development unless it is of the opinion that such development is consistent with the objectives for the zone in which it is proposed to be carried out.

The note helps to explain various clauses, but is not part of the legal document
NOTE: The village zone covers the towns and villages outside Lithgow, providing for residential development but allowing a wider range of development, including uses necessary within urban areas in rural settings.

(02) 6354 9999
(02) 6351 4259
www.lithgow.nsw.gov.au
council@lithgow.nsw.gov.au
ADDRESS CORRESPONDENCE TO GENERAL MANAGER
PO BOX 19, LITHGOW NSW 2790

1. **Objectives of the zone**
The objectives of the zone are:
(a) to promote development which is compatible with an urban function within a rural area;
(b) to maintain the rural atmosphere of the village;
(c) to safeguard residential amenity within the village; and
(d) to prevent pollution of water supply catchments and water quality in major water storages.

2. **Without development consent**
Development for the purpose of single dwellings, where:
(a) a sewer is available; or
(b) the Council is satisfied by a geotechnical assessment that disposal of domestic waste water within the boundaries of the allotment is feasible.

3. **Only with development consent**
Any development except that permitted without consent or prohibited.

4. **Prohibited**
Development for the purpose of extractive industries; intensive livestock keeping establishments; junk yards; mines; offensive or hazardous industries.

DOES A STATE ENVIRONMENTAL PLANNING POLICY, REGIONAL ENVIRONMENTAL PLAN OR DRAFT STATE ENVIRONMENTAL PLANNING POLICY OR REGIONAL ENVIRONMENTAL PLAN OF WHICH THE MINISTER HAS NOTIFIED THE COUNCIL APPLY TO THE LAND?

Yes - See Annexure "A".
Clause 29 of the Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 affects the provisions of certain State Environmental Planning Policies and how they apply to the land. A copy of Clause 29 (Annexure "B") is included and should be read in conjunction with the State Environmental Planning Policies listed.

WHERE THE LAND IS VACANT, IS THE ERECTION OF A DWELLING HOUSE PROHIBITED BY REASON OF A STANDARD RELATING TO THE MINIMUM AREA ON WHICH A DWELLING MAY BE ERECTED?

No, if the land is vacant.
Not applicable, if a dwelling is constructed on the land.

DOES THE DEMOLITION OF ANY BUILDING ON THE LAND REQUIRE DEVELOPMENT CONSENT TO BE OBTAINED?

Clause 29 of the Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 (Annexure "B") provides that development consent is required for the demolition of a building.

DOES A DEVELOPMENT CONTROL PLAN APPLY TO THE LAND?

No.

DOES A SECTION 94 CONTRIBUTIONS PLAN APPLY TO THE LAND?

Section 94 Contribution Plans apply to coal related developments and to certain developments in 1(a),1(c),1(d) and 1(f) rural zonings with respect to Rural Roads and Rural Fire Services. For further details please contact Council.

WOULD ANY APPLICATION TO CARRY OUT DEVELOPMENT ON THE LAND CONSTITUTE STATE SIGNIFICANT DEVELOPMENT IN ACCORDANCE WITH SECTION 76A(7)(B) OF THE ACT?

Yes - Development to which SEPP No. 34 and SEPP No. 48 applies. Also new coal mines requiring new coal leases, certain extractive industries, certain aquaculture industries, railway freight terminals in specific circumstances and environmentally sensitive areas of State significance.

IS THE LAND EFFECTED BY SECTION 38 OR 39 OF THE COASTAL PROTECTION ACT, 1979, AS NOTIFIED BY THE DEPARTMENT OF PUBLIC WORKS?

No.

HAS THE LAND BEEN PROCLAIMED TO BE WITHIN A MINE SUBSIDENCE DISTRICT WITHIN THE MEANING OF SECTION 15 OF THE MINE SUBSIDENCE COMPENSATION ACT, 1961?

No.

IS THE LAND AFFECTED BY ANY ROAD WIDENING AND/OR REALIGNMENT UNDER -
1) DIV 2, PART 3, ROADS ACT, 1993
2) PLANNING INSTRUMENT
3) RESOLUTION OF COUNCIL?

Not at this date.

IS THE LAND AFFECTED BY A RESOLUTION ADOPTED BY COUNCIL OR ANOTHER PUBLIC AUTHORITY TO RESTRICT DEVELOPMENT BY REASON OF THE LIKELIHOOD OF:
1) LANDSLIP
2) SUBSIDENCE
3) BUSHFIRE
4) TIDAL INUNDATION
5) ACID SULPHATE SOIL
6) ANY OTHER RISK?

The land is not shown as bush fire prone in Council's records. Further, no Council resolution exists for the land in relation to any other hazards listed above.

IS ANY DEVELOPMENT ON THE LAND SUBJECT TO FLOOD RELATED DEVELOPMENT CONTROLS? (Not including development for the purpose of Group Homes or Seniors Housing)

No

IS THE DEVELOPMENT ON THAT LAND OR PART OF THE LAND FOR ANY OTHER PURPOSE SUBJECT TO FLOOD RELATED DEVELOPMENT CONTROLS?

No

IS THE LAND RESERVED FOR ACQUISITION?

Only that land zoned No. 6 - Open Space is reserved under the Local Environmental Plan to be acquired. The owner of any land within Zone No. 6 may, by notice in writing, require the Council to acquire the land. On receipt of any such notice, the Council must acquire the land to which the notice relates.

IS THE LAND AFFECTED BY MATTERS ARISING UNDER THE CONTAMINATED LAND MANAGEMENT ACT 1997?

Not known.

DOES THE LAND INCLUDE OR COMPRISE OF A CRITICAL HABITAT, CONSERVATION AREA OR AN ITEM OF ENVIRONMENTAL HERITAGE?

YES - The property retains a heritage item as listed under LEP 1994. Please contact Council's Environmental & Planning Division for further information in this regard.
(See Annexure "A" Attached)

THE ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT ACT 1997 COMMENCED OPERATION ON 1 JULY 1997. AS A CONSEQUENCE OF THIS ACT THE INFORMATION CONTAINED IN THIS CERTIFICATE NEEDS TO BE READ IN CONJUNCTION WITH THE PROVISIONS OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT (AMENDMENT REGULATION 1998, ENVIRONMENTAL PLANNING AND ASSESSMENT (FURTHER AMENDMENT) REGULATION 1998, AND ENVIRONMENTAL PLANNING AND ASSESSMENT (SAVINGS AND TRANSITIONAL) REGULATION 1998

T. A. Nicholls

for Roger Bailey
GENERAL MANAGER
30/10/2008

For any further information, please contact the Regional Services Administration Division on (02) 63549989.

ANNEXURE "A"

THE FOLLOWING STATE POLICIES AND DIRECTIONS EFFECT LAND WITHIN LITHGOW CITY

STATE ENVIRONMENTAL PLANNING POLICY No. 1 - DEVELOPMENT STANDARDS

This Policy provides flexibility in the application of planning controls operating by virtue of development standards in circumstances where strict compliance with those standards would, in any particular case, be unreasonable or unnecessary.

STATE ENVIRONMENTAL PLANNING POLICY No. 4 - DEVELOPMENT WITHOUT CONSENT

This Policy provides that Development Consent is not required for certain permissible development.

STATE ENVIRONMENTAL PLANNING POLICY No. 6 - STOREYS

This Policy is designed to remove any confusion arising from the interpretation of provisions in environmental planning instruments which control the height of buildings by reference to a number of storeys, floors or levels which the building contains, by specifying the manner in which that number is to be determined.

STATE ENVIRONMENTAL PLANNING POLICY No. 8 - SURPLUS PUBLIC LAND

This Policy applies to surplus public lands so as to allow for sale and development in an appropriate manner.

STATE ENVIRONMENTAL PLANNING POLICY No. 9 - GROUP HOMES

This Policy controls the development of group homes on all lands where dwellings are allowed. A group home is a dwelling used to provide household environment for persons who are disabled or otherwise socially disadvantaged, whether those persons are related or not, and either with or without paid or unpaid supervision or care.

STATE ENVIRONMENTAL PLANNING POLICY No. 11 - TRAFFIC GENERATING DEVELOPMENTS

This Policy ensures that the Roads and Traffic Authority is made aware of and is given an opportunity to make representations in respect of certain traffic generating development.

STATE ENVIRONMENTAL PLANNING POLICY No. 15 - RURAL LAND-SHARING COMMUNITIES

This Policy makes rural land-sharing communities permissible within rural and non-urban zones. With Council consent, people can, collectively, own and manage a single lot of land and use it as their principal residence. Development must be environmentally sensitive and sustainable.

STATE ENVIRONMENTAL PLANNING POLICY No. 16 – TERTIARY INSTITUTIONS

Permits *any* kind of tertiary institution on land zoned for a *specific* kind of tertiary institution. It applies to land:
On which development for a particular class of tertiary institution may be carried out, either with or without development consent, but on which development for other classes of tertiary institution is prohibited.
Used for a college of advanced education before the date on which this policy came into effect.

STATE ENVIRONMENTAL PLANNING POLICY No. 21 - CARAVAN PARKS

This Policy facilitates long term residency in caravan parks, including subdivision by long leases of up to twenty (20) years. All new caravan parks require development consent, subject to the requirements of the policy.

STATE ENVIRONMENTAL PLANNING POLICY No. 22 - SHOPS AND COMMERCIAL PREMISES

The Policy allows, with the consent of Council, a change of use from a shop to another kind of shop or commercial premises or alternatively a commercial premises to a shop or another kind of commercial premises where the new use is prohibited under an environmental planning instrument, if the Council is satisfied that the change of use will have not more than a minor environmental impact and is in keeping with the objectives (if any) of the zone.

STATE ENVIRONMENTAL PLANNING POLICY No. 27 - PRISON SITES

This Policy facilitates the erection and use of buildings for prisons on specific sites in New South Wales.

STATE ENVIRONMENTAL PLANNING POLICY No. 30 – INTENSIVE AGRICULTURE

This Policy requires development consent for cattle feedlots of 50 or more head of cattle; requires that applications for cattle feedlots of between 50 and 1,000 cattle provide information on measures to prevent water and air pollution, soil degradation and ensure animal welfare; requires that application for cattle feedlots of between 50 and 1,000 head are advertised to allow public participation.

ANNEXURE "A" CONT

STATE ENVIRONMENTAL PLANNING POLICY No. 32 - URBAN CONSOLIDATION (REDEVELOPMENT OF URBAN LAND)

This Policy provides criteria to identify land in existing urban areas suitable for multi unit housing having regard to the regional significance of that land.

STATE ENVIRONMENTAL PLANNING POLICY No. 33 - HAZARDOUS AND OFFENSIVE DEVELOPMENT

This Policy requires specified matters to be considered by consent authorities for development proposals which are potentially hazardous or potentially offensive as defined in the policy.

STATE ENVIRONMENTAL PLANNING POLICY No. 36 – MANUFACTURED HOMES ESTATES

Helps establish well-designed and properly serviced manufactured home estates (MHEs) in suitable locations. Affordability and security of tenure for residents are important aspects. The policy applies to Gosford, Wyong and all local government areas outside the Sydney Region. To enable the immediate development of estates, the policy allows MHEs to be located on certain land where caravan parks are permitted. There are however, criteria that a proposal must satisfy before the local council can approve development. The policy also permits, with consent, the subdivision of estates either by community title or by leases of up to 20 years. A Section 117 direction issued in conjunction with the policy guides councils in preparing local environmental plans for MHEs, enabling them to be excluded from the policy.

STATE ENVIRONMENTAL PLANNING POLICY No. 44 - KOALA HABITAT PROTECTION

The purpose of this Policy is to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas. This will ensure that permanent free living populations will be maintained over their present range. The policy applies to 107 local government area within the known geographic range of koalas. The Policy provides that council can not issue consent, to affected development applications, without an investigation for core koala habitat. This Policy provides a state-wide approach to ensure that appropriate development can continue, while still ensuring the ongoing protection of koalas and their habitat.

STATE ENVIRONMENTAL PLANNING POLICY No. 48 - MAJOR PUTRESCIBLE LAND FILL SITES

This Policy makes the Minister for Urban Affairs and Planning the consent authority for major putrescible landfills in NSW. It applies to all landfills in the state which receive waste from more than one local government area, when the volume of waste to be received exceeds thresholds specified in the State Environmental Planning Policy. The Policy includes Heads of Consideration which specify the matters the Minister will need to take into account when assessing a proposal. These Heads of Consideration include ensuring that there is a legitimate demand for landfill, and ensuring that it is appropriately located. This will ensure that landfills are only approved following a comprehensive assessment.

STATE ENVIRONMENTAL PLANNING POLICY No. 55 – REMEDIATION OF LAND

Introduces statewide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the Environment Protection Authority, has prepared *Managing Land Contamination: Planning Guidelines*.

STATE ENVIRONMENTAL PLANNING POLICY No. 60 – EXEMPT AND COMPLYING DEVELOPMENT

Provides a more efficient and effective process for certain classes of development. The Policy is an essential part of the reforms introduced to the development assessment system in July, 1998. It applies to areas of the State where there are no such provisions in the Council's local plans.

STATE ENVIRONMENTAL PLANNING POLICY No. 64 – ADVERTISING AND SIGNAGE

Aims to improve the amenity of urban and natural settings by managing the impact of outdoor advertising. The policy responds to growing concerns from the community, the advertising industry and local government that existing controls and guidelines were not effective. SEPP No, 64 offers the comprehensive provisions and consistent approach needed.

ANNEXURE "A" CONT

STATE ENVIRONMENTAL PLANNING POLICY No. 65 – DESIGN QUALITY OF RESIDENTIAL FLAT DEVELOPMENT

Raises the design quality of residential flat development across the state through the application of a series of design principles. Provides for the establishment of Design Review Panels to provide independent expert advice to Councils on the merit of residential flat development. The accompanying regulation requires the involvement of a qualified designer throughout the design, approval and construction stages

STATE ENVIRONMENTAL PLANNING POLICY (BUILDING SUSTAINABILITY INDEX: BASIX 2004)

This SEPP operates in conjunction with Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004 to ensure the effective introduction of BASIX in NSW. The SEPP ensures consistency in the implementation of BASIX throughout the State by overriding competing provisions in other environmental planning instruments and development control plans, and specifying that SEPP No. 1 does not apply in relation to any development standard arising under BASIX.

PLEASE NOTE: Pursuant to the Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004, fulfilment of BASIX commitments does not take effect in the Lithgow City Council area until on and from 1 July 2005.

STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007

The aim of this Policy is to facilitate the effective delivery of infrastructure across the State by:

(a) improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and
(b) providing greater flexibility in the location of infrastructure and service facilities, and
(c) allowing for the efficient development, redevelopment or disposal of surplus government owned land, and
(d) identifying the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development), and
(e) identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development, and
(f) providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.

STATE ENVIRONMENTAL PLANNING POLICY (RURAL LANDS) 2008

The aims of this Policy are as follows:

(a) to facilitate the orderly and economic use and development of rural lands for rural and related purposes,
(b) to identify the Rural Planning Principles and the Rural Subdivision Principles so as to assist in the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State,
(c) to implement measures designed to reduce land use conflicts,
(d) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
(e) to amend provisions of other environmental planning instruments relating to concessional lots in rural subdivisions.

STATE ENVIRONMENTAL PLANNING POLICY (TEMPORARY STRUCTURES AND PLACES OF PUBLIC ENTERTAINMENT) 2007

The aims of this Policy are as follows:

(a) to ensure that suitable provision is made for ensuring the safety of persons using temporary structures or places of public entertainment,
(b) to encourage the protection of the environment at the location, and in the vicinity, of places of public entertainment or temporary structures by (among other things) managing noise, parking and traffic impacts and ensuring heritage protection,
(c) to specify the circumstances in which the erection and use of temporary structures are complying development or exempt development,
(d) to promote opportunities for buildings (including temporary structures) to be used as places of public entertainment by specifying the circumstances in which that use is complying development or exempt development,
(e) to promote the creation of jobs in the public entertainment industry,
(f) to increase access for members of the public to public entertainment.

STATE ENVIRONMENTAL PLANNING POLICY (HOUSING FOR SENIORS OR PEOPLE WITH A DISABILITY) 2004

Encourage the development of high quality accommodation for ageing population and for people who have disabilities – housing that is in keeping with the local neighbourhood.

ANNEXURE "A" CONT

STATE ENVIRONMENTAL PLANNING POLICY (MAJOR PROJECTS) 2005

The aims of this Policy are as follows:

(a) to identify development to which the development assessment and approval process under Part 3A of the Act applies,

(b) to identify any such development that is a critical infrastructure project for the purposes of Part 3A of the Act,

(c) to facilitate the development, redevelopment or protection of important urban, coastal and regional sites of economic, environmental or social significance to the State so as to facilitate the orderly use, development or conservation of those State significant sites for the benefit of the State,

(d) to facilitate service delivery outcomes for a range of public services and to provide for the development of major sites for a public purpose or redevelopment of major sites no longer appropriate or suitable for public purposes,

(e) to rationalise and clarify the provisions making the Minister the approval authority for development and sites of State significance, and to keep those provisions under review so that the approval process is devolved to councils when State planning objectives have been achieved.

STATE ENVIRONMENTAL PLANNING POLICY (MINING, PETROLEUM PRODUCTION AND EXTRACTIVE INDUSTRIES) 2007

The aims of this Policy are, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries: (a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.

STATE ENVIRONMENTAL PLANNING POLICY (STATE SIGNIFICANT DEVELOPMENT) 2005

The aims of this Policy are as follows:

(a) to identify development of economic, social or environmental significance to the State or regions of the State so as to provide a consistent and comprehensive assessment and decision making process for that development,

(b) to facilitate the development, redevelopment or protection of important urban, coastal and regional sites of economic, environmental or social significance to the State so as to facilitate the orderly use, development or conservation of those State significant sites for the benefit of the State,

(c) to facilitate service delivery outcomes for a range of public services and to provide for the development of major sites for a public purpose or redevelopment of major sites no longer appropriate or suitable for public purposes,

(d) to rationalise and clarify the provisions making the Minister the consent authority for State significant development and State significant sites and to keep those provisions under review so that the consent powers are devolved to councils when the State planning objectives have been achieved.

THE FOLLOWING DRAFT STATE ENVIRONMENTAL PLANNING POLICY APPLIES TO THE LAND:

DRAFT STATE ENVIRONMENTAL PLANNING POLICY (APPLICATION OF DEVELOPMENT STANDARDS) 2004

Currently SEPP No. 1 provides local councils with flexibility in applying development standards. The Department, in consultation with councils and the community, has undertaken a comprehensive review of how SEPP No. 1 has been used over the past 20 years. This review has led to a new draft policy that provides clearer and tighter criteria that development applicants must meet if they wish to vary from a development standard. The aim is to have the flexibility to achieve better planning outcomes. Once gazetted, the policy replaces SEPP No. 1.

THE FOLLOWING REGIONAL PLAN APPLIES TO LAND WITHIN THE DRINKING WATER CATCHMENTS OF SYDNEY:

DRINKING WATER CATCHMENT REGIONAL ENVIRONMENTAL PLAN NO. 1 (REP NO.1)

This plan aims:

a) to create healthy water catchments that will deliver high quality water while sustaining diverse and prosperous communities; and

b) to provide the statutory components in *Sustaining the Catchments* that together with the non-statutory components in *Sustaining the Catchments*, will achieve the aim set out in paragraph (a); and

c) to achieve the water quality management goals of:

i) improving water quality in degraded areas and critical locations where water quality is not suitable for the relevant environmental values; and

ii) maintaining or improving water quality where it is currently suitable for the relevant environmental values.

ANNEXURE "B"

Clause 29	**Environmental Planning and Assessment (Savings and Transitional) Regulation 1998**
Part 3	Provisions arising from amendment of Environmental Planning and Assessment Act
Division 3	1979

Division 3 General

29 Certain activities require development consent under amended EP&A Act 1979

(1) This clause applies to development consisting of:
  (a) prescribed activity proposed to be carried out within the area of a council, or
  (b) the subdivision of land within the area of a council, including development proposed to be carried out in connection with an existing use, but not including development referred to in subclause (2).

(2) This clause does not apply to development of the kind referred to in subclause (1) that consists of:
  (a) any activity that, immediately before the appointed day, was specified in item 6 of Part A of the Table to section 68 of the unamended LG Act 1993 (relating to the use and occupation of uncompleted buildings), or
  (b) any prescribed activity (other than an activity referred to in paragraph (a)) that, immediately before the appointed day, was exempted, excluded or suspended from the requirement for approval under the unamended LG Act 1993:
    (i) by the *Local Government (Approvals) Regulation 1993*, as in force immediately before the appointed day, or
    (ii) by a local approvals policy in force under the unamended LG Act 1993 (being a local approvals policy that is still in force at the time the development application for development consent is made), or
    (iii) by or under the provisions of any Act, including the provisions of an environmental planning instrument of a kind referred to in section 28 of the unamended EP&A Act 1979, or
  (c) any subdivision of land that, immediately before the appointed day, was exempted from the requirements for approval under the repealed LG Act 1919 by or under the provisions of that or any other Act, including the provisions of an environmental planning instrument of a kind referred to in section 28 of the unamended EP&A Act 1979, or
  (d) any development:
    (i) carried out by the Crown, or
    (ii) carried out by any person prescribed by the regulations under the amended EP&A Act 1979 for the purposes of section 115M of that Act (as referred to in section 115H (a) of that Act) in relation to Crown building work, being development that constitutes an activity within the meaning of Part 5 of that Act, or
  (e) any prohibited development, or
  (f) any development for which development consent was required, immediately before the appointed day, by an environmental planning instrument or that is required by any new provisions of an environmental planning instrument made before or on the appointed day, or, in the case of an environmental planning instrument that was in the course of preparation before the appointed day but not made before or on the appointed day, made after the appointed day and before 1 October 1998, or
  (g) any activity within the meaning of Part 5 of the Act:
    (i) in respect of which an application for approval to a determining authority within the meaning of that Part has been made, but not finally determined, immediately before the appointed day, or
    (ii) which was approved by a determining authority within the meaning of that Part before the appointed day and that commences pursuant to that approval not later than 3 years after the appointed day.

(3) Development to which this clause applies may not be carried out except with development consent.

(4) Development consent may not be granted in relation to development for a prescribed activity that involves the erection of a building unless the requirements of Division 4 of Part 1 of Chapter 7 of the unamended LG Act 1993 have been complied with.

(5) The requirements relating to the notification of proposed development under the amended EP&A Act 1979 (including any requirements applied by clause 32 (1)) do not apply to a development application for development for which the requirements referred to in subclause (4) are required to be complied with.

(6) Subclauses (4) and (5) apply only if a local approvals policy (being a local approvals policy with respect to the notification of applications for approvals) is in force under the unamended LG Act 1993 at the time the development application for development consent is made.

(7) This clause has effect despite the existing provisions of any environmental planning instrument made before the appointed day, but is subject to any new provisions of an environmental planning instrument made before, on or after the appointed day.

(8) The consent authority for the purposes of development to which this clause applies is the council unless, by or under the Act, some other person is the consent authority for the purposes of that development.

(9) Despite Part 9 of the amended EP&A Regulation 1994, the fee for an application to carry out development of the kind to which this clause applies, being the erection of a building within the meaning of the unamended LG Act 1993, is the fee determined in accordance with an order under clause 33.

(10) In this clause:
  existing provision means a provision made before the appointed day.
  new provision means a provision made on or after the appointed day.

(11) This clause ceases to have effect on 1 July 2000.

ANNEXURE "D"

SECTION 149(5) ADVICE

(a)	Is the land affected by a Tree Preservation Order?	Council has adopted a Tree Preservation Order for public lands only. See attached Tree Preservation Order.
(b)	Has any development consent with respect to the land been granted within the previous five years?	NO

LITHGOW CITY COUNCIL

Tree Preservation Order

a) The Council of the City of Lithgow, for the purpose of preserving existing amenity and protection of the natural environment, hereby makes a Tree Preservation Order pursuant to the provisions of the Environmental Planning Assessment Act 1979.

b) This Tree Preservation Order prohibits the ringbarking, cutting down, lopping, topping, removal or any other activity that may result in the demise of any tree situated on public property, including the application of herbicides, transplanting and/or pruning, without the prior written consent of Council. Public property shall include all Council owned land including parks, reserves and road reserves, land owned by the Crown, any Government Authority or State owned Corporation but excluding any specific exemptions under the Environmental Planning and Assessment Model Provisions or any other Act.

c) This Tree Preservation Order relates to all trees on public land with a height of greater than four metres and a spread of greater than three metres or a trunk circumference of greater than 300mm measured at one metre above the ground. This Order applies to all trees and categories of trees which do not come under the jurisdictions of other acts.

d) Any trees approved by Council for removal under this Order shall be replaced by at least one other tree of reasonable size which shall be maintained until it is mature. This condition may not apply where Council deems that such action is inappropriate.

e) Any person who contravenes or causes or permits to be contravened the provisions of this Tree Preservation Order shall be guilty of an offence and liable to prosecution.

May 1997 (amended March 2000)

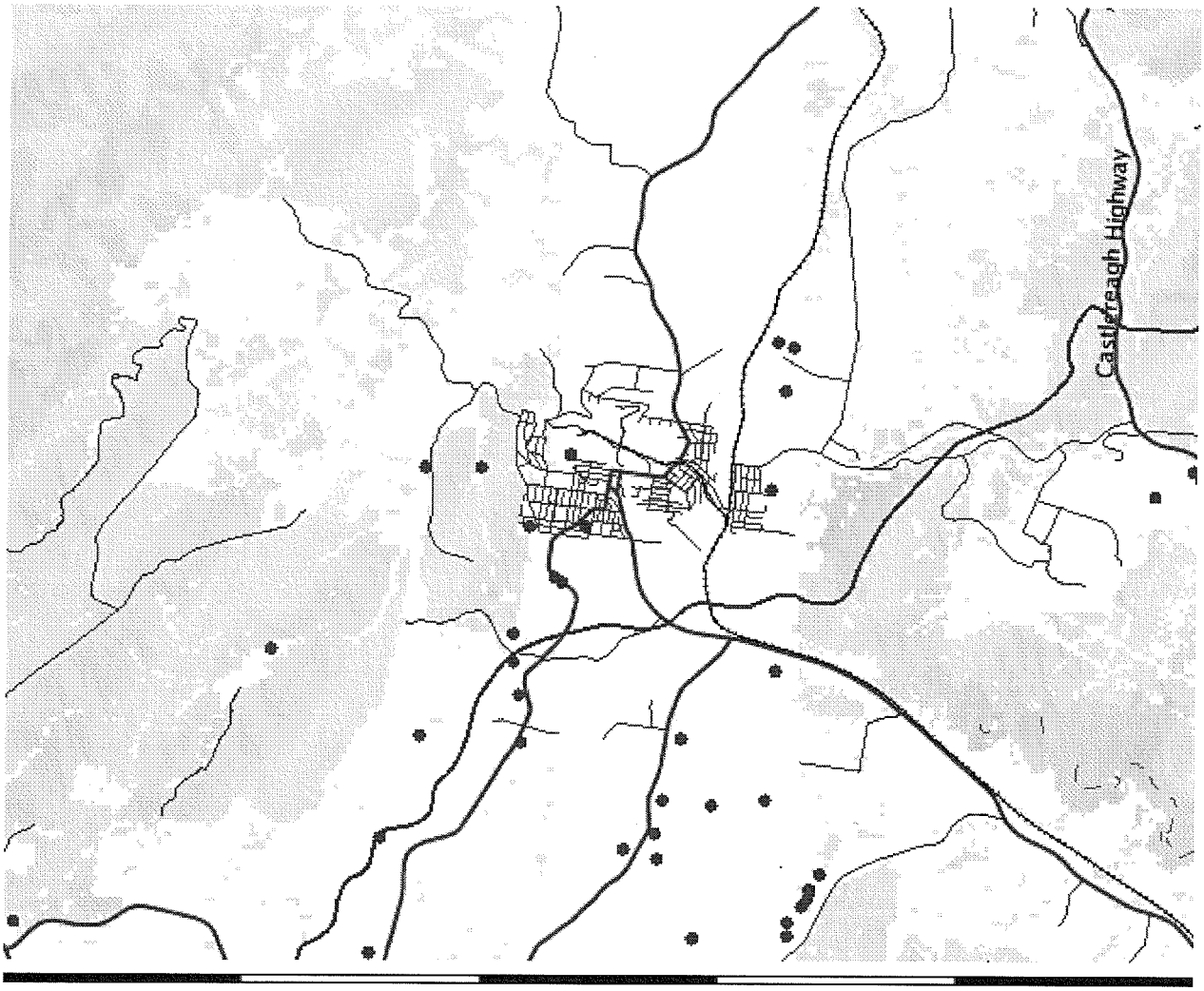
Groundwater Bores

Appendix C

Portland

Map created with NSW Natural Resource Atlas - http://nratlas.nsw.gov.au

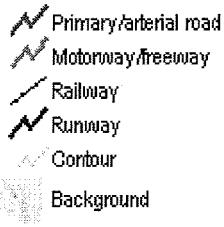
Wednesday, October 22, 2008



0 12 Km

Legend

Symbol	Layer	Custodian
	Cities and large towns renderImage: Cannot build image from features	
Capital	Populated places renderImage: Cannot build image from features	
	Towns	
	Groundwater Bores	
	Catchment Management Authority boundaries	
	Major rivers	
	Topographic base map	



Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 22, 2008

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW053598

Works Details (top)

GROUNDWATER NUMBER	GW053598
LIC-NUM	80BL120696
AUTHORISED-PURPOSES	INDUSTRIAL
INTENDED-PURPOSES	POWER GENERATION
WORK-TYPE	Excavation
WORK-STATUS	Other
CONSTRUCTION-METHOD	> 100 sq.m.
OWNER-TYPE	Other Govt
COMMENCE-DATE	
COMPLETION-DATE	1981-06-01
FINAL-DEPTH (metres)	60.00
DRILLED-DEPTH (metres)	0.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	- LOWER MURRAY (D/S COROWA)
GW-ZONE	- MURRAY - CALIVIL RENMARK
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	80 - MACQUARIE-WESTERN
RIVER-BASIN	421 - MACQUARIE RIVER
AREA-DISTRICT	
CMA-MAP	8831-2N
GRID-ZONE	55/3
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6305818.00
EASTING	777016.00
LATITUDE	33 21' 4"
LONGITUDE	149 58' 36"
GS-MAP	0057D2

AMG-ZONE	55
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROXBURGH
PARISH	CULLEN BULLEN
PORTION-LOT-DP	99999

Licensed (top)

COUNTY	ROXBURGH
PARISH	CULLEN BULLEN
PORTION-LOT-DP	PORTLAND TOWNSHIP

Water Bearing Zones (top)

no details

Drillers Log (top)

no details

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 22, 2008

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW056349

Works Details (top)

GROUNDWATER NUMBER	GW056349
LIC-NUM	80BL121525
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	DOMESTIC
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Rotary Air
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1981-09-01
FINAL-DEPTH (metres)	36.60
DRILLED-DEPTH (metres)	36.60
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	- LOWER MURRAY (D/S COROWA)
GW-ZONE	- MURRAY - CALIVIL RENMARK
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	80 - MACQUARIE-WESTERN
RIVER-BASIN	421 - MACQUARIE RIVER
AREA-DISTRICT	
CMA-MAP	8831-2N
GRID-ZONE	55/3
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6304951.00
EASTING	777146.00
LATITUDE	33 21' 32"
LONGITUDE	149 58' 42"
GS-MAP	0057D2

AMG-ZONE	55
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROXBURGH
PARISH	CULLEN BULLEN
PORTION-LOT-DP	L6 (SEC 58)

Licensed (top)

COUNTY	ROXBURGH
PARISH	CULLEN BULLEN
PORTION-LOT-DP	L6

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.60	0.60	Topsoil		
0.60	7.30	6.70	Clay		
7.30	13.70	6.40	Sandstone Weathered		
13.70	30.50	16.80	Limestone		
30.50	36.60	6.10	Granite		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 22, 2008

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW003756

Works Details (top)

GROUNDWATER NUMBER	GW003756
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	PUBLIC/MUNICIPL
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Cable Tool
OWNER-TYPE	P.W.D.
COMMENCE-DATE	
COMPLETION-DATE	1940-12-01
FINAL-DEPTH (metres)	55.20
DRILLED-DEPTH (metres)	55.20
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	80 - MACQUARIE-WESTERN
RIVER-BASIN	421 - MACQUARIE RIVER
AREA-DISTRICT	
CMA-MAP	8831-2N
GRID-ZONE	55/3
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6305690.00
EASTING	776106.00
LATITUDE	33 21' 9"
LONGITUDE	149 58' 1"
GS-MAP	0057D2

AMG-ZONE	55
COORD-SOURCE	PR.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROXBURGH
PARISH	CULLEN BULLEN
PORTION-LOT-DP	99999

Licensed (top)

no details

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Threaded Steel	0.00	19.20	203			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
8.50	11.50	3.00	Fractured	11.60		0.38			(Unknown)
20.10	21.30	1.20	Fractured	8.80		2.37			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	2.74	2.74	Clay		
2.74	8.53	5.79	Rock Yellow		
8.53	11.58	3.05	Rock Grey Some Hard Seams Water Supply		
11.58	14.94	3.36	Quartz		
14.94	16.15	1.21	Rock Slate		
16.15	18.29	2.14	Rock Hard		
18.29	19.51	1.22	Rock		
19.51	21.34	1.83	Limestone Water Supply		
21.34	24.99	3.65	Rock		
24.99	28.35	3.36	Rock Seams		
28.35	29.26	0.91	Rock		
29.26	31.09	1.83	Rock		
31.09	32.00	0.91	Rock		
31.09	32.00	0.91	Quartz Very Seamy		

32.00	32.61	0.61	Driller
32.61	33.53	0.92	Rock Slate
33.53	35.05	1.52	Slate
35.05	36.27	1.22	Rock Broken
36.27	39.93	3.66	Slate Hard
39.93	43.89	3.96	Rock Grey
43.89	49.68	5.79	Rock Hard
43.89	49.68	5.79	Some Seams
49.68	55.17	5.49	Rock Hard

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 22, 2008

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW057387

Works Details (top)

GROUNDWATER NUMBER	GW057387
LIC-NUM	80BL125308
AUTHORISED-PURPOSES	DOMESTIC STOCK
INTENDED-PURPOSES	NOT KNOWN
WORK-TYPE	Bore open thru rock
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Rotary Air
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1983-03-01
FINAL-DEPTH (metres)	45.70
DRILLED-DEPTH (metres)	45.70
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	- LOWER MURRAY (D/S COROWA)
GW-ZONE	- MURRAY - CALIVIL RENMARK
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	80 - MACQUARIE-WESTERN
RIVER-BASIN	421 - MACQUARIE RIVER
AREA-DISTRICT	
CMA-MAP	8831-2N
GRID-ZONE	55/3
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6304967.00
EASTING	776577.00
LATITUDE	33 21' 32"
LONGITUDE	149 58' 20"
GS-MAP	0057D2

AMG-ZONE	55
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROXBURGH
PARISH	CULLEN BULLEN
PORTION-LOT-DP	L2 DP627940 (140)

Licensed (top)

COUNTY	ROXBURGH
PARISH	CULLEN BULLEN
PORTION-LOT-DP	2 627940

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Welded Steel	-0.30	3.70	160			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
21.30	21.60	0.30	Fractured	15.20		0.13			(Unknown)
32.00	32.30	0.30	Fractured	15.20		0.13			(Unknown)
42.70	43.00	0.30	Fractured	15.20		0.06			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.30	0.30	Topsoil		
0.30	3.70	3.40	Clay		
3.70	45.70	42.00	Shale Water Supply		

NSW EPA Notices

Appendix D

NSW EPA

Print Close page

Site and notice details

Your search for: Suburb: Portland

2 notices on 1 site were matched.

Area No: 3118

The information below was correct at the time the notices were issued.

Site: Blue Circle Southern Cement
Address: Williwa Street, Portland, 2847
LGA: Lithgow City Council

Occupier: Blue Circle Southern Cement Ltd
Owner: Blue Circle Southern Cement Ltd

Lot 1 DP 109595	Lot 2 DP 749903	Lot 3 DP 749905	Lot 4 DP 749906	Lot 5 DP 749907
Lot 6 DP 749908	Lot 7 DP 749909	Lot 104 DP 755769	Lot 174 DP 755769	Lot 52,53 DP 755769
Lot 24/46 DP 758855	Lot 1 DP 842890			

Notices relating to this site (0 current and 2 former)

(Map) where available, maps show the part of the site affected by the notice

* notice matched search criteria

Notice recipient	Notice type & number	Status	Date
Blue Circle Southern Cement Ltd	Revocation Notice* 528	Former	Issued 06 Oct 1999
Blue Circle Southern Cement Ltd	Investigation Order* 410	Former	Issued 17 Aug 1995 Revoked 06 Oct 1999

22 October 2008

CERTIFIED MAIL
Blue Circle Southern Cement Ltd
P O BOX 42
WENTWORTHVI LLE NSW 2145

Our Reference: 260141/D1/ Not. Nos. 002046

Your Reference: UBL # 3118; Notice # 410

17 AUG1995

NOTICE UNDER SECTION 35
OF THE ENVIRONMENTALLY HAZARDOUS CHEMICALS ACT 1985

WHEREAS -

A. Blue Circle Southern Cement Limited (BCSC) is the occupier of premises at Williwa Street Portland more fully described in the Schedule and known as Portland Cement Works (the 'premises').

B. The Environment Protection Authority (EPA) has reasonable grounds to believe that soil and water on the premises are contaminated with heavy metals and may be contaminated with polycyclic aromatic hydrocarbons (PAHs) as a consequence of cement manufacturing and associated operations on the premises.

In accordance with the powers vested in the EPA by the provisions of Part 5 of the Environmentally Hazardous Chemicals Act 1985 and section 35 in particular, the EPA directs BCSC to:

1. Prepare and submit to the EPA by 17 October 1995 a draft sampling and analysis protocol. The draft protocol should be prepared by suitably qualified persons and include a proposed timetable not extending beyond 17 January 1996 for sampling and analysis of waters, soil and sediment and carrying out a hydrological study over the whole premises in the manner described in this notice:

   a) all sampling and analysis must be carried out in accordance with:(i) "Test Methods for Evaluating Solid Waste" (SW-836), 4th Edition (1992), Office of Solid Waste and Emergency Response, USEPA, or a NATA endorsed complementary method; or (ii) "Standard Methods for Analysis of Water and Wastewater" American Public Health Association (APHA), 18th Edition (1992).

2. Upon approval by the EPA and in accordance with the draft protocol as amended, if relevant, collect samples of water, soil and sediment from all surface waters, the floor sediments of all water filled quarries and storages, and all fly ash handling and storage areas on the premises. Samples must be taken prior to any removal of surface or subsurface contamination. The samples shall be analysed for a range of organic and inorganic species. The analysis shall include a full range of metal species, PAHs, organochlorines and total phenolic compounds.

3. Submit to the EPA by 17 January 1996 one or more reports:

   (a) detailing the dates and locations of all sampling, the results of the analyses and their interpretation; and

   (b) indicating the relationships between groundwater, the water currently in the quarries, and surface waters.

4. Prepare and submit to the EPA by 17 January 1996 a draft remediation plan, including consideration of on-going monitoring both on and off-site.

5. The EPA must be notified in writing at least 2 months prior to any dealings or proposed dealings affecting the land title to the premises or the tenure of BCSC, including with regard to the renewal, transfer or request for cancellation of any authority under the Mining Act 1992.

Note: If you neglect or fail to comply with this notice, you may be prosecuted for breaching section 35(1) of the Environmentally Hazardous Chemical Act.

NEIL SHEPHERD
Director General

(signed 17/08/1995)

per
RICHARD WHYTE
REGIONAL MANAGER
CENTRAL WEST
(By Authorisation)

cc Greater Lithgow City Council and Department of Mineral Resources

SCHEDULE

Land including:
Lot 1 DP 842890 Lot 2 DP 749903 Lot 3 DP 749905 Lot 4 DP 749906 Lot 5 DP 749907 Lot 6 DP 749908 Lot 7 DP 749909 Lot 1 DP 109595 lot 24 Sec 46 DP 758855 Por 53 Por 104 Por 174 Part Por 52 PO 57/15 PO 79/3 ML 195 ML 411 ML 804 PLL 1132 ML 2806 ML 2851 ML 2906 ML 2941 ML 5673 PLL 953 ML 410 MPL 1098 ML 3263 PLL 3576 ML 306 MPL 393 ML 2949 ML 3177 ML 3208 ML 3209 ML 2851

Cement, including with regard to the renewal, transfer or request for cancellation of any authority under the Mining Act 1992.

SCHEDULE
Land including:
Lot 1 DP 842890
Lot 2 DP 749903
Lot 3 DP 749905
Lot 4 DP 749906
Lot 5 DP 749907
Lot 6 DP 749908
Lot 7 DP 749909
Lot 1 DP 109595
Lot 24 sec 46 DP 758855
por 53
por 104
por 174
part por 52
PO 57/15
PO 79/3
ML 195
ML 411
ML 804
PLL 1132
ML 2806
ML 2851
ML 2906
ML 2941
ML 5673
PLL 953
ML 410
MPL 1098
ML 3263
PLL 3576
ML 306
MPL 393
ML 2949
ML 3177
ML 3208
ML 3209
ML 2851

REGISTERED MAIL
General Manager
Blue Circle Southern Cement Ltd
Powers Road
SEVEN HILLS NSW 2147

CHF32386/CH4775
Notice Number 528

ENVIRONMENTALLY HAZARDOUS CHEMICALS ACT, 1985
NOTICE UNDER SECTION 35

WHEREAS:-

A: Blue Circle Southern Cement Ltd (ACN 008 421 761) is the occupier of the premises located at Williwa Street, Portland, more fully described in the Schedule and known as Portland Cement Works (the 'premises').

B. The premises were deemed to be contaminated with heavy metals and polycyclic aromatic hydrocarbons (PAHs) in soils and waters, as a consequence of cement manufacturing and associated operations on the premises.

C. Notice number 410 pursuant to Section 35 of the Environmentally Hazardous Chemicals Act 1985 was served on Blue Circle Southern Cement Ltd, the occupier of the premises, on 17 August 1995. The notice specified requirements for the investigation of soil, water and sediment contamination, and the subsequent preparation of a draft remediation plan.

D. All the conditions of Notice No. 410 have been complied with.

TAKE NOTE THAT:-
In accordance with the powers vested in the Environment Protection Authority (EPA) by the provisions of Section 35 of the Environmentally Hazardous Chemicals Act 1985, the EPA hereby revokes Notice number 410 dated 17 August 1995.

NEIL SHEPHERD
Director-General

(signed 6 Oct 1999)

CATHY DYER
Manager Contaminated Sites
(by delegation)

cc. EPA CLM Act record
EPA Regional Manager Central West
Lithgow City Council

NOTE:
The EPA must be notified in writing at least two months prior to any dealings or proposed dealings affecting the land title to the premises or the tenure of Blue Circle Southern

Analytical Laboratory Report and Data Validation

Appendix E

,

URS

Analytical Data Validation Form

Project Name:	BCSC Portland P1 ESA	**Project/Task Number:**	43177139.00000
Analytical Laboratory:	ALS	**Batch/Ref. Number(s):**	ES0816123
Date Sampled:	31/10/2008	**Sample Type:**	Solid

Sample Handling, Receipt and Holding Times	Yes/No	Comments
COC completed adequately	Yes	
Samples received intact and chilled	Yes	Sample Temperature 6.4 ˚C
Samples analysed within appropriate holding times per analytical methods	Yes	

# of Primary Samples	# of QAQC Samples	# of Duplicate Samples	# of Triplicate Samples
3	0	0	0

Blanks
Method Blank (MB), Rinsate Blank (RB), Trip Blank (TB), Field Blank (FB)

Type	Comments
MB	All Blanks acceptable. Results less than the limit of reporting

Laboratory Control Samples (LCS)

Analyte	Comments
	Acceptable. All laboratory control sample recoveries were within the control limits

Matrix Spike (MS)

Analyte	Comments
	Acceptable. All matrix spikes were within the control limits

Trip Spike /Control Trip Spike

Analyte	% R	Comments
Not Conducted		

Duplicates

Laboratory Duplicates	Comments
	Acceptable. Laboratory duplicate RPDs were within the control limits

Intra-Laboratory Duplicates	Comments
not conducted	

Inter-Laboratory Duplicates	Comments
not conducted	

Surrogate Monitoring Compound Analyses

Analyte	Comments
	Acceptable. Surrogate recoveries were within the control limits.

Overall Comments

The analytical data evaluation has not highlighted any exceedences in quality control. The results are therefore considered fit for reporting.

Notes:
%R = Percent Recovery, RPD = Relative Percent Difference, LOR = Limit of Reporting
Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

Performed By:	T. Onus	Reviewed By:	S. Bourne
Date:	19-Nov-08	Date:	20-Nov-08

CHAIN OF CUSTODY FORM

Sheet of

THIS COLUMN FOR LAB USE ONLY

Job Code:

Due Date:

FROM:
URS (AUSTRALIA)
ACN 000 691 690
North Sydney
Level 3 116 Miller Street
Ph: 8925 5500

DATE:

TO:
ALS Smithfield
Woodpark Road
Smithfield 2164
Fax: 8925 5555

Project No:
43177139
Project Manager:
Penny Baker
Agreement No:

Sampler(s): Tom Onus 0408665 517
Signature(s):
Checked:

Custody seal intact? YES NO

Sample cold? YES NO

Released for URS by: T. Onus
Date: 3/11/08 Time: 9:00

Received for Laboratory by: SARADA 6.4°C
Date: 03-11-08 Time: 3:20 p.m

Container Size, Type, Preservative and Analysis

Container Identification

Size
Type*
Preservative Code
Analytes

Lab identification	Date	Time	Matrix	Sample Number	Comments	Total no	Metals - 8	PAHs	HOLD
							Tick required analytes		
1	31/10/2008	11:00	solid	SP01_31/10/08			×	×	
2	31/10/2008	11:00	solid	SP02_31/10/08			×	×	
3	31/10/2008	11:00	solid	SP03_31/10/08			×	×	

Environmental Division
Sydney
Work Order
ES0816123

Telephone : +61-2-8784 8555

Remarks:

TOTAL

* Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinsed Jar; S = Solvent Washed Acid Rinsed Glass Bottle; VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric

Courier Job No:

Specify Turnaround Time:
Please email report to: Thomas_Onus@urscorp.com

NOTE: SAMPLES MAY CONTAIN DANGEROUS AND HAZARDOUS SUBSTANCES

CHAIN OF CUSTODY FORM

11.11.08

Sheet of

OLUMN
AB USE ONLY

ode:

ate:

FROM:
URS (AUSTRALIA)
ACN 000 691 690
North Sydney
Level 3 116 Miller Street
Ph: 8925 5500

DATE:

TO:
ALS Smithfield
Woodpark Road
Smithfield 2164
Fax: 8925 5555

Project No:
43177139
Project Manager:
Penny Baker
Agreement No:

Sampler(s): Tom Onus 0408665 517
Signature(s):
Checked:

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mple cold? S NO

Released for URS by: T. Onus
Date: 3/11/08 Time: 9:00

Received for Laboratory by: SARADA 6.4°C
Date: 03.11.08 Time: 3:20 p.m

Container Size, Type, Preservative and Analysis

Container Identification	Size	Type*	Preservative Code	Analytes	Metals - 8	PAHs											HOLD
				Total no	Tick required analytes												
Identification	Date	Time	Matrix	Sample Number	Comments												
1	31/10/2008	11:00	solid	SP01_31/10/08			×	×									
2	31/10/2008	11:00	solid	SP02_31/10/08			×	×									
3	31/10/2008	11:00	solid	SP03_31/10/08			×	×									

Environmental Division
Sydney
Work Order
ES0816123

Telephone : +61-2-8784 8555

arks:

TOTAL

* Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinsed Jar; S = Solvent Washed Acid Rinsed Glass Bottle; VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric

ier Job No:

Specify Turnaround Time:
Please email report to: Thomas_Onus@urscorp.com

NOTE: SAMPLES MAY CONTAIN DANGEROUS AND HAZARDOUS SUBSTANCES

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0816123**	Page	: 1 of 5
Client	: **URS AUSTRALIA (NSW) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR TOM ONUS	Contact	: Charlie Pierce
Address	: LEVEL 3, 116 MILLER STREET NORTH SYDNEY NSW, AUSTRALIA 2060	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: thomas_onus@urscorp.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 89255500	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 89255555	Facsimile	: +61-2-8784 8500
Project	: 43177139	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ORICA BIO TRIALS	Date Samples Received	: 03-NOV-2008
Sampler	: TO	Issue Date	: 11-NOV-2008
Site	: ----		
		No. of samples received	: 3
Quote number	: EN/001/08 V2	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
		Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist (Semi-Volatile)	Organics
Victor Kedicioglu	Business Manager - NSW	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = Chemistry Abstract Services number
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Poor duplicate precision for Zn due to sample heterogeneity.**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SP01_31/10/08	SP02_31/10/08	SP03_31/10/08	----	----
				Client sampling date / time	31-OCT-2008 12:00	31-OCT-2008 12:00	31-OCT-2008 12:00	----	----
Compound	CAS Number	LOR	Unit		ES0816123-001	ES0816123-002	ES0816123-003	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		7.8	6.4	9.4	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		10	8	16	----	----
Copper	7440-50-8	5	mg/kg		35	45	35	----	----
Lead	7439-92-1	5	mg/kg		18	17	16	----	----
Nickel	7440-02-0	2	mg/kg		11	7	9	----	----
Zinc	7440-66-6	5	mg/kg		41	38	38	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		87.4	82.0	81.8	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		90.4	79.8	81.4	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		94.7	67.0	66.7	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		101	100	99.3	----	----
Anthracene-d10	1719-06-8	0.1	%		105	96.9	96.1	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		102	98.3	100	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

QUALITY CONTROL REPORT

Work Order	: **ES0816123**	Page	: 1 of 6
Client	: **URS AUSTRALIA (NSW) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR TOM ONUS	Contact	: Charlie Pierce
Address	: LEVEL 3, 116 MILLER STREET NORTH SYDNEY NSW, AUSTRALIA 2060	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: thomas_onus@urscorp.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 89255500	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 89255555	Facsimile	: +61-2-8784 8500
Project	: 43177139	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ORICA BIO TRIALS	Date Samples Received	: 03-NOV-2008
Sampler	: TO	Issue Date	: 11-NOV-2008
Order number	: ----		
		No. of samples received	: 3
Quote number	: EN/001/08 V2	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
		Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist (Semi-Volatile)	Organics
Victor Kedicioglu	Business Manager - NSW	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = Chemistry Abstract Services number
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 803051)									
ES0816111-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	Anonymous	Anonymous	Anonymous	Anonymous
ES0816111-010	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	Anonymous	Anonymous	Anonymous	Anonymous
EG005T: Total Metals by ICP-AES (QC Lot: 803274)									
ES0816107-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Chromium	7440-47-3	2	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Nickel	7440-02-0	2	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Arsenic	7440-38-2	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Copper	7440-50-8	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Lead	7439-92-1	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Zinc	7440-66-6	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
ES0816128-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Chromium	7440-47-3	2	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Nickel	7440-02-0	2	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Arsenic	7440-38-2	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Copper	7440-50-8	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Lead	7439-92-1	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Zinc	7440-66-6	5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 803276)									
ES0816107-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
ES0816128-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 802987)									
ES0816095-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 802987) - continued									
ES0816095-001	Anonymous	EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	Anonymous	Anonymous	Anonymous	Anonymous

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 803274)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	107	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	102	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	101	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	105	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	109	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	104	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	103	81.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 803276)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	95.2	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 802987)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	104	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	106	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	103	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	101	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	109	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	106	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	101	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	104	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	106	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	104	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	98.9	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	103	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	96.8	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	102	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	106	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	106	72.4	114

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 803274)							
ES0816107-001	Anonymous	EG005T: Arsenic	7440-38-2	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Cadmium	7440-43-9	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Chromium	7440-47-3	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Copper	7440-50-8	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Lead	7439-92-1	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Nickel	7440-02-0	Anonymous	Anonymous	Anonymous	Anonymous
		EG005T: Zinc	7440-66-6	Anonymous	Anonymous	Anonymous	Anonymous
EG035T: Total Recoverable Mercury by FIMS (QCLot: 803276)							
ES0816107-001	Anonymous	EG035T: Mercury	7439-97-6	Anonymous	Anonymous	Anonymous	Anonymous
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 802987)							
ES0816095-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	Anonymous	Anonymous	Anonymous	Anonymous
		EP075(SIM): Pyrene	129-00-0	Anonymous	Anonymous	Anonymous	Anonymous

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0816123**	Page	: 1 of 5
Client	: URS AUSTRALIA (NSW) PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR TOM ONUS	Contact	: Charlie Pierce
Address	: LEVEL 3, 116 MILLER STREET NORTH SYDNEY NSW, AUSTRALIA 2060	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: thomas_onus@urscorp.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 89255500	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 89255555	Facsimile	: +61-2-8784 8500
Project	: 43177139	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ORICA BIO TRIALS	Date Samples Received	: 03-NOV-2008
Sampler	: TO	Issue Date	: 11-NOV-2008
Order number	: ----		
		No. of samples received	: 3
Quote number	: EN/001/08 V2	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
SP01_31/10/08, SP02_31/10/08, SP03_31/10/08	**31-OCT-2008**	**----**	----	----	**04-NOV-2008**	07-NOV-2008	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
SP01_31/10/08, SP02_31/10/08, SP03_31/10/08	**31-OCT-2008**	**04-NOV-2008**	29-APR-2009	✓	**05-NOV-2008**	29-APR-2009	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
SP01_31/10/08, SP02_31/10/08, SP03_31/10/08	**31-OCT-2008**	**04-NOV-2008**	29-APR-2009	✓	**05-NOV-2008**	28-NOV-2008	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
SP01_31/10/08, SP02_31/10/08, SP03_31/10/08	**31-OCT-2008**	**04-NOV-2008**	14-NOV-2008	✓	**05-NOV-2008**	14-DEC-2008	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0816123**		
Client	: **URS AUSTRALIA (NSW) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR TOM ONUS	Contact	: Charlie Pierce
Address	: LEVEL 3, 116 MILLER STREET NORTH SYDNEY NSW, AUSTRALIA 2060	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: thomas_onus@urscorp.com	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 89255500	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 89255555	Facsimile	: +61-2-8784 8500
Project	: 43177139	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ORICA BIO TRIALS	Quote number	: ES2008URSNSW0039 (EN/001/08)
Site	: ----		
Sampler	: TO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 03-NOV-2008	Issue Date	: 04-NOV-2008 08:50
Client Requested Due Date	: 11-NOV-2008	Scheduled Reporting Date	: **11-NOV-2008**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 6.4'C - Ice present
No. of coolers/boxes	: 1 HARD ESKY	No. of samples received	: 3
Sercurity Seal	: Not intact.	No. of samples analysed	: 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample temperature breach to 6.4' C.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Nanthini Coilparampil
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
ES0816123-001	31-OCT-2008 12:00	SP01_31/10/08	✓	✓
ES0816123-002	31-OCT-2008 12:00	SP02_31/10/08	✓	✓
ES0816123-003	31-OCT-2008 12:00	SP03_31/10/08	✓	✓

Requested Deliverables

EQUIS URS_EDMS

- EDI Format - EQUIS V5	Email	urs_edms@urscorp.com

MR TOM ONUS

- *AU Certificate of Analysis - NATA	Email	thomas_onus@urscorp.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	thomas_onus@urscorp.com
- AU Interpretive QC Report (Anon QCI Not Rep)	Email	thomas_onus@urscorp.com
- AU QC Report (Anon QC Not Rep) - NATA	Email	thomas_onus@urscorp.com
- Default - Chain of Custody	Email	thomas_onus@urscorp.com
- EDI Format - ENMRG	Email	thomas_onus@urscorp.com
- EDI Format - MRED	Email	thomas_onus@urscorp.com

PENNY BAKER

- *AU Certificate of Analysis - NATA (COA)	Email	penny_baker@urscorp.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	penny_baker@urscorp.com
- AU Interpretive QC Report (Anon QCI Not Rep) (QCI_NoAnon)	Email	penny_baker@urscorp.com
- AU QC Report (Anon QC Not Rep) - NATA (QC_NoAnon)	Email	penny_baker@urscorp.com
- Default - Chain of Custody (COC)	Email	penny_baker@urscorp.com
- EDI Format - ENMRG (ENMRG)	Email	penny_baker@urscorp.com
- EDI Format - MRED (MRED)	Email	penny_baker@urscorp.com

THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice	Email	sydney_accounts@urscorp.com

BARRY F COSIER SOLICITORS

PROPOSED RESIDENTIAL SUBDIVISION, WILLAWA STREET, PORTLAND

ENVIRONMENTAL SITE ASSESSMENT

E12591/1-AE

4 February, 2002

Coffey

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

E12591/1-AE JML
4 February, 2002

Barry F Cosier Solicitors
50 Main Street
LITHGOW NSW 2790

Attention: Mr Lloyd Monck

Dear Sir,

RE: PROPOSED RESIDENTIAL SUBDIVISION, WILLAWA STREET, PORTLAND
ENVIRONMENTAL SITE ASSESSMENT

Coffey Geosciences Pty Ltd (Coffey) is pleased to provide our Environmental Site Assessment (ESA) report for the above site.

We draw your attention to the enclosed sheet entitled "Important Information About Your Coffey Environmental Site Assessment" which should be read in conjunction with the report.

We trust that our report meets with your requirements. If you require any further information regarding our report, please do not hesitate to contact either of the undersigned.

For and on behalf of

COFFEY GEOSCIENCES PTY LTD

ROSS BEST
Senior Principal

JOSHUA LASKY
Project Manager

Distribution: Original Coffey Geosciences Pty Ltd File E12591/1
1 copy Coffey Geosciences Pty Ltd Library
4 copies Barry F Cosier Solicitors (3 bound, 1 unbound)

142 Wicks Road North Ryde
NSW 2113 Australia
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NSW 1670 Australia
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Facsimile +61 2 9888 9977
Email sydney@coffey.com.au

EXECUTIVE SUMMARY

This report presents the results of an Environmental Site Assessment (ESA) undertaken by Coffey Geosciences Pty Ltd (Coffey) for a proposed residential subdivision located at Willawa Street, Portland. It is understood that the ESA is required to support the development application for the proposed residential subdivision on the site.

The ESA revealed that the site is likely to be suitable for the proposed residential use with gardens and accessible soil (home grown produce contributing less than 10% fruit and vegetable intake, no poultry) subject to:

- Further delineation then remediation and/or management of heavy metal contamination in near surface soil across the site;
- Undertaking a hazardous materials assessment of remaining buildings on the site and managing any hazardous materials identified appropriately to prevent recontamination of near surface soils.

It is recommended that additional sampling and analysis be undertaken by Coffey or another suitably qualified environmental consultant to further assess the extent of heavy metal in near surface soil. Following the additional sampling and analysis, it is recommended that a remediation action plan (RAP) be prepared outlining remediation and validation procedures for the heavy metal contaminated near surface soil.

It is considered that the most feasible remediation option for the heavy metal contaminated soil is likely to be excavation of the contaminated material and then either offsite disposable of the material to a suitably licensed landfill or reuse of the material on a part of the cement works which will be used for less sensitive use such as commercial/industrial.

Prior to removal of the soil from the site it would need to be classified in accordance with the NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.

1. INTRODUCTION

1.1 General

This report presents the results of an Environmental Site Assessment (ESA) undertaken by Coffey Geosciences Pty Ltd (Coffey) for a proposed residential subdivision located at Willawa Street, Portland (see Figure 1).

The work was commissioned by Mr Lloyd Monck in a facsimile dated 23 January, 2002. The commission was in response to a Coffey proposal dated 23 January, 2002 (Ref: E12591/1-AB).

It is understood that the ESA is required to support the development application for a proposed residential subdivision on the site.

1.2 Proposed Development

The proposed subdivision layout is shown on Figure 1. According to the proposed subdivision layout, a residential subdivision of approximately 1.3Ha comprising 23 allotments is proposed for the site.

It is understood that four of the existing residential cottages on the site will be retained and refurbished while four existing cottages will be demolished. A number of new residential dwellings will be constructed across the site. A road will be constructed along the northern boundary of the site while a second road will be constructed between proposed lots 14 and 15 to Willawa Street.

1.3 Objectives and Scope of Work

The objectives of the Environmental Site Assessment were to:

- identify potentially contaminating activities that are currently being performed on the site and that may have been performed on the site in the past;
- make an assessment of potential contamination issues by undertaking soil sampling and testing; and
- advise on additional investigations and/or remediation work that may need to be undertaken before the site can be considered suitable for the proposed residential use.

The scope of work included:

- a site history review and site visit to identify potential Areas of Environmental Concern (AECs) and chemicals of concern (COCs);
- field investigations;
- laboratory analysis;
- data assessment; and
- reporting.

Assessing the buildings on the site for the presence of hazardous materials such as asbestos, lead paint and PCB containing light fittings was not included in the study.

2. SITE DESCRIPTION

2.1 Location and Site Features

The site is located on Willawa Street, Portland and is known as Lot 1 DP 109592 and Part Portion 52 within the Lithgow Shire Council municipality. The bulk of the site comprises a rectangular area which is proposed to be divided into 22 allotments with the 23rd allotment separated from the main part of the site by an existing building. The site has a total area of approximately 1.3Ha.

The main western part of the site is rectangular in shape and has an has an area of about 1.2Ha with dimensions of about 280m x 45m. This part of the site is bounded by Willawa Street to the south, church land to the west, the Portland Cement Works Quarry to the north and a block of land containing an annex building and childcare centre to the east.

The western part of the site is located on two levels separated by a steep bank which slopes down to the west. The slope is covered by several pine trees. Seven semi-detached painted brick cottages with corrugated iron rooves were located on the area to the east of the bank at the time of the site visit. The cottages fronted Willawa Street and had grass backyards. A substantial proportion of the paint on the cottages was observed to be peeling. A number of corrugated iron carports and sheds were located in the backyards. There were also a number of concrete slabs in some of the backyards which could have been associated with former sheds. Most of the cottages had fibro annexes at the rear. Some of the cottages were separated by wooden and corrugated iron fences which were in poor condition. At the time of the site visit, the area to the west of the bank was vacant and grass covered.

The smaller eastern part of the site is rectangular in shape and has an has an area of about 600m² with dimensions of 24.2m x 24.6m. This part of the site is bounded by Willawa Street to the south, a vacant block of land to the east, the block of land containing an annex building and childcare centre to the east and a workshop associated with the cement works to the north.

At the time of the site visit, a painted brick cottage with a corrugated iron roof (which was formerly known as 'the casino' was located in the eastern part of the site. The cottage was surrounded by a grass yard with a number of trees in the backyard.

No visual evidence of petroleum hydrocarbon contamination such as oil staining was observed on the site. Vegetation on the site appeared to be healthy.

A large proportion of rainwater falling on the site is likely to infiltrate into site soils while any runoff would be directed to Willawa Street.

2.2 Surrounding Landuse

The surrounding landuse is as follows:

- The former Cement Works Quarry and facilities to the north
- Church land to the west;
- Vacant land to the immediate east and facilities associated with the Cement Works further to the east;
- Commercial properties including a service station across Willawa Road to the south of the part of the site to the east of the bank;
- Residential dwellings across Willawa Road to the south of the part of the site to the west of the bank;
- An annex building and child care centre in between the two parts of the site.

2.3 Local Geology and Hydrogeology

The Bathurst 1:250,000 Geological Sheet produced by the geological survey of NSW, suggests that the site is underlain by quartz greywacke and slate which overlies shale and limestone.

Groundwater beneath the site is expected to occur in the bedrock, however it is possible that groundwater perched on clay or bedrock may be present.

3. SITE HISTORY REVIEW

The site history study undertaken by Coffey included:

- a site visit;
- interviews;
- a review of a heritage report on the area;
- a check of NSW EPA records for notices on the site; and
- a review of historical aerial photography for the last 50 years.

3.1 Site Visit

A Coffey Environmental Scientist visited the site on 24 January, 2002. Observations made during the site visits are summarised in Section 2.1 and Section 2.2.

3.2 Interviews

A telephone interview was carried out with Mr Mark James, who has worked on the site for a number of years and has lived in the area for around thirty years. Mr James provided the following information:

- The cottages on the site were used for housing workers of the cement works;
- As far as Mr James is aware, the area has only ever been used for residential purposes and there has never been significant chemical storage on the site;
- The annex building in between the western and eastern parts of the site formerly was used for munitions storage during world War II and was subsequently used for storage of components for the Cement Works and for use as a community hall. The smaller building on that lot was used as a day care centre;
- Four fibro cottages were demolished about three years ago on the lower part of the site. They were demolished by contractors licensed to remove asbestos. The asbestos was disposed of offsite.

An interview was carried out with Mr Lloyd Monck, a representative of the developers of the site. He provided the following information:

- The cottages on the site have been there for a long period of time, some as long as around 100 years;
- The cottages were used for housing employees of the cement works;
- As far as Mr Monck is aware, the site has only ever been used as housing;
- The annex building in between the western and eastern parts of the site formerly was used for munitions storage;

3.3 Aerial Photograph Review

Aerial Photographs of the site were purchased from the Aerial Photos Section of the Department of Land and Water Conservation. The results of the assessment may be summarised as follows:

- The earliest available photograph from 1954 revealed that the seven cottages which are currently located in the western part of the site to the east of the bank were already present. In addition, four cottages were located in the currently vacant area to the east of the bank. What appeared to be a dirt road was located in the area where the steep vegetated bank is now located. The cottage which is now located in the eastern part of the site was already present. The cottages were surrounded by grass covered yards. With respect to surrounding landuse, the annex building in between the eastern and western parts of the site was already present and the church buildings to the west of the site were already present. The Cement Works Quarry was present to the north of the site and the main Cement Works facilities were located to the east of the site. The workshop which is currently located to the north of the eastern part of the site had not yet been constructed. The landuse across Willawa Street to the south of the site appeared to be similar to today.
- The aerial photograph from 1964 revealed that the main features of the site and surrounding land had not changed significantly from 1954.
- The aerial photograph from 1972 revealed that the main features of the site had not changed significantly from 1964. It appears that the from workshop had been constructed to the north of the eastern part of the site;
- By 1993, the dirt road which was seen in the previous photographs was no longer present and had been replaced by the steeply sloping bank covered by trees. Otherwise, the main features of the site and surrounding land had not changed significantly from 1972.
- The most recent aerial photograph from 1998 revealed that the main features of the site and surrounding land had not changed significantly from 1993. This suggests that that the four cottages in the western part of the site were demolished after 1998;

3.4 NSW EPA Records

A check with the NSW EPA Pollution Line on the 4th of August, 2002 revealed that a notice was issued on the Portland Cement Works under Section 35 of the Environmentally Hazardous Chemicals Act (1995). The notice was issued on the 17th of August 1995. It is unclear whether the site currently being investigated was covered by the notice.

The notice stated that the EPA had reasonable grounds to believe that soil and water on the premises was contaminated with heavy metals and PAHs as a consequence of cement manufacturing and associated operations on the premises. The EPA directed the occupier to sample and analyse waters, soil and sediment and to carry out a hydrological study over the whole premises. The EPA also directed the occupier to submit a report detailing the findings of the investigation and if necessary submitting a draft remediation plan.

On 6 August 1999, the EPA issued a second notice on the Portland Cement Works stating that the occupier had complied with all the conditions of the 1995 notice.

Copies of the notices are included in Appendix A.

3.5 Heritage Report

A brief review was undertaken of the report entitled "A Heritage Assessment of the Portland Cement Works", prepared for Blue Circle Southern Cement Limited by Peter Fenwick in September 1993.

The report covered the Cement Works including the eastern part of the site. The western part of the site was excluded from the study area. The following relevant information was obtained from the report:

- Limestone quarrying commenced in the Portland area in 1869 and cement production commenced in 1887;
- The Commonwealth Portland Cement Works operated from 1902 until 1991. In 1974 the Cement Works were purchased by Blue Circle Southern Cement Limited.
- A plan from the early 1900s shows the seven cottages to the east of the bank and the casino building were already present. The part of the site to the west of the bank was vacant. The annex building was not yet present.
- The church to the west of the site was built in the early 1900s.
- The annexe was built for munitions storage in 1943.

3.6 Summary of Site History

The information obtained from the site history review and site walkover revealed that the site contained residential cottages for workers of the Commonwealth Portland Cement Works since the early 1900s. A total of twelve cottages were originally on the site of which four have recently been demolished.

No evidence of the presence of underground storage tanks (USTs) or above ground storage tanks (ASTs) nor of the storage of hazardous chemicals was identified during the site history review.

Potential offsite sources of contamination include a service station located across Williawa Street to the south of the site, the Cement Works facilities located to the east of the site including a workshop to the north of the eastern part of the site and the annex building located between the western and eastern parts of the site which was formerly used as a munitions store.

In 1995, the EPA issued a notice on the Portland Cement Works under Environmentally Hazardous Chemicals Act (1995) instructing the occupier to undertaken an assessment of contamination on the Portland Cement Works. It is unclear whether or not the site currently being investigated was covered by the order. The EPA issued a second notice in 1999 stating that the occupier had complied with the conditions of the 1995 notice.

4. POTENTIAL AREAS OF ENVIRONMENTAL CONCERN (AEC)

Based on the site history potential areas of environmental concern (AECs) and associated chemicals of concern were identified. These are summarised in Table 1.

TABLE 1: SUMMARY OF POTENTIAL AREAS AND CHEMICALS OF CONCERN

Potential AECs	Description of potentially contaminating activity	CoCs*	Likelihood of Contamination (Based on Site History Study Only)**	Remarks
1. Sheds and Buildings	Leaching or weathering of contaminants potentially contained in building materials (i.e. lead from lead based paint, zinc from galvanised corrugated iron and asbestos from fibro)	Metals Asbestos	Metals - High Asbestos - Medium	Likely to be present as a large number of localised hotspots around existing sheds/buildings and areas which formerly contained sheds/buildings. If present, likely to be limited to near surface soil.
2. Remainder of Site	Potential burial of fill material	Metals TPH PAH OCP Asbestos	Low to Medium	No evidence of significant filling of the site was encountered during the site history review. However, it is possible that buried fill areas not identified in the site history review may be present.
3. On Site Migration	Potential migration of contaminants from adjacent sites	TPH BTEX Metals PAH	Low	Potential sources of onsite migration include the Cement Works facilities to the east of the site and the service station across Willawa Street to the south of the site. Taking into account the topography of the site and surrounding land and the distance of potential contamination sources to the site, the likelihood of onsite contaminant migration is considered to be low.

*CoC - Chemicals of Concern

** It is important to note that this is not an assessment of the financial risk associated with the AEC in the event contamination is detected, but a qualitative assessment of the probability of contamination being detected at the potential AEC based on the site history study.

Metals include Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Zinc and Nickel

BTEX - Benzene, Toluene, Ethylbenzene and Xylene

TPH - Total Petroleum Hydrocarbon

PAH - Polynuclear Aromatic Hydrocarbon

OCP- Organochlorine Pesticides

5. REGULATORY BACKGROUND AND APPLICABLE GUIDELINES

For assessing contamination levels in soil in urban settings, the NSW EPA, (1998) Guidelines for the NSW Site Auditor Scheme present health based investigation levels for different landuses (e.g. industrial/commercial, residential, recreational etc.) as well as provisional phytotoxicity based threshold concentrations.

As the site is to be redeveloped as a residential subdivision, the guidelines for residential sites with gardens and accessible soil (home-grown produce contributing less than 10% fruit and vegetable intake, no poultry) are considered the most applicable to this site.

For residential sites with gardens and accessible soil (home-grown produce contributing less than 10% fruit and vegetable intake, no poultry), the lower of the human health based threshold levels listed in Column 1 and the provisional phytotoxicity based guidelines listed in Column 5 of the table in the NSW EPA (1998) guidelines may be adopted as investigation or acceptance criteria for the respective contaminants of concern.

NSW EPA (1998) do not provide threshold levels for TPH. NSW EPA (1994) Guidelines for Assessing Service Station Sites, provide an indication of acceptable cleanup levels for petroleum hydrocarbons compounds at service station sites to be reused for sensitive landuses such as residential.

The relevant NSW EPA (1998) and NSW EPA (1994) threshold concentrations are summarised in Table 4 of Section 7.

6. FIELD INVESTIGATIONS

6.1 Soil Sampling

Fieldwork was carried out by a Coffey Environmental Engineer and a Coffey Environmental Scientist on 24 January, 2002.

The fieldwork comprised:

- Excavation of fifteen test pits (identified as TP1 to TP15) across the site using a backhoe. The test pits were spread across the site to provide a reasonable site coverage for the ESA. Due to access restraints the test pits located to the east of the bank were all located in the backyards of the existing cottages. The test pits were excavated to depths ranging between 1.1m and 2.0m. Environmental soil samples were generally collected at two depths from each test pit. Samples were collected from the wall of the test pits using a decontaminated stainless steel trowel;
- Drilling of thirteen hand auger holes (identified as BH1 to BH11). The hand auger holes were mostly located within 1m of cottages/buildings to assess potential leaching or weathering of contaminants contained in building materials. The hand auger holes were drilled to depths ranging between 0.3m and 0.8m. Soil samples were collected directly from the hand auger.

The sampling locations are shown on Figure 1. Hand auger boreholes and test pit logs are included in Appendix B.

Soil samples were divided into two sub-samples, one of which was placed into a laboratory-supplied, acid-rinsed 250mL glass jar, the other of which was bagged for field headspace screening. The samples were placed in a cooler box chilled with ice.

A photoionisation detector (PID) was used to screen the headspace gases of the bagged soil samples. The PID provides a semi-quantitative indication of the presence of volatile organic compounds in the soil. The PID used was a Minirae calibrated with isobutylene gas at 104ppm prior to use.

6.2 Field Quality Assurance/Quality Control

Sampling activities, were based on procedures and protocols outlined in Coffey's Environmental Field Manual (QP15/5-E, June 1995, revised September 1997) which is based on industry accepted standard practice.

Sampling equipment that came directly in contact with the soil (e.g. hand auger, trowel) was decontaminated between samples by scrubbing with a solution of Decon-90, a phosphate-free detergent followed by rinsing with potable water. A clean pair of disposable gloves was used when handling each sample.

A wash blank (identified as WB-25-1-02) was collected by running laboratory supplied deionised water over the hand auger and into sample bottles. The wash blank was used to check the efficacy of field decontamination procedures.

Three duplicate soil samples identified as TP4A 0.1-0.3 (dup of TP4 0.1-0.3), TP8A 0.1-0.3 (dup of TP8 0.1-0.3) and TP10A (dup of TP10 0.1-0.3) were submitted for laboratory analysis. The duplicate samples were used to check whether the field sampling and laboratory procedures adequately reproduced results

6.3 Laboratory Analysis

The soil samples were dispatched to the Australian Laboratory Services (ALS) Environmental, a NATA registered laboratory, in one batch under chain of custody conditions on 25 January 2002.

A total of twenty-nine soil samples (plus three duplicate samples and one wash blank) were selected for laboratory analysis. The other samples were held in the laboratory for future analysis if required.

The laboratory analysis schedule is summarised in Table 2.

TABLE 2: SOIL SAMPLING AND ANALYSIS SCHEDULE

Area	Sampling Locations	Sample I.D	Material Description	Laboratory Analysis
Western Part of Site to the East of the Bank (Proposed Lots 1 to 14)	TP2	TP2 /0.1-0.35	Fill	Heavy Metals, TPH, BTEX, PAH
	TP2	TP2 / 0.4-0.65	Fill	Heavy Metals
	TP3	TP3 / 0.25-0.45	Fill	Heavy Metals, PAH
	TP4	TP4 / 0.1-0.3	Fill	Heavy Metals, TPH, BTEX, PAH
	TP5	TP5 / 0.25-0.55	Fill	Heavy Metals, PAH
	TP6	TP6 / 0.25-0.45	Fill	Heavy Metals, TPH, BTEX, PAH, Asbestos
	TP7	TP7 / 0.0-0.21	Fill	Heavy Metals, PAH
	TP7	TP7 / 0.35-0.55	Fill	Heavy Metals
	BH1	BH1 / 0.0-0.3	Fill	Heavy Metals
	BH2	BH2 / 0.0-0.3	Fill	Heavy Metals
	BH5	BH5 / 0.0-0.3	Fill	Heavy Metals
	BH6	BH6 / 0.0-0.3	Fill	Heavy Metals, Asbestos
	BH7	BH7 / 0.0-0.3	Fill	Heavy Metals, Asbestos
	BH8	BH8 / 0.0-0.3	Fill	Heavy Metals, Asbestos
	BH9	BH9 / 0.0-0.3	Fill	Heavy Metals, Asbestos
	BH10	BH10 / 0.0-0.3	Fill	Heavy Metals, Asbestos
	BH11	BH11 / 0.0-0.3	Fill	Heavy Metals, Asbestos
Western Part of the Site to the West of the Bank (Proposed Lots 15 to 22)	TP8	TP8 / 0.1-0.3	Fill	Heavy Metals, Asbestos
	TP9	TP9 / 0.2-0.4	Fill	Heavy Metals
	TP9	TP9 / 1.0-1.2	Residual	Heavy Metals
	TP10	TP10 / 0.1-0.3	Residual	Heavy Metals, TPH, BTEX, PAH, Asbestos
	TP11	TP11 / 0.1-0.3	Fill	Heavy Metals, PAH, Asbestos
	TP12	T12 / 0.0-0.15	Fill	Heavy Metals, Asbestos
	TP13	TP13 / 0.1-0.3	Fill	Heavy Metals, TPH, BTEX, PAH
	TP14	TP14 / 0.0-0.2	Fill	Heavy Metals, Asbestos
	TP14	TP14 / 0.8-1.0	Residual	Heavy Metals
Eastern Part of Site (Proposed Lot 23)	TP15	TP15 / 0.1-0.3	Fill	Heavy Metals, PAH, Asbestos
	BH3	BH3 / 0.0-0.3	Fill	Heavy Metals, Asbestos
	BH4	BH4 / 0.0-0.3	Fill	Heavy Metals
QA/QC	TP4	TP4A / 0.1-0.3	Dup of TP4 / 0.1-0.3	Heavy Metals, TPH, BTEX, PAH
	TP8	TP8A / 0.1-0.3	Dup of TP8 / 0.1-0.3	Heavy Metals, Asbestos
	TP10	TP10A / 0.1-0.3	Dup of TP10 / 0.5-0.6	Heavy Metals, TPH, BTEX, PAH, Asbestos
	Wash Blank	WB25-1-02	Water	Heavy Metals

Heavy metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Zinc and Nickel
OPP – Organophosphorus Pesticides
TPH - Total Petroleum Hydrocarbon

7. RESULTS & SITE CHARACTERISATION

7.1 Subsurface Conditions

From test pit and hand-auger hole observations, the site is underlain by a fill material ranging in thickness from 0.1m to 0.75m in the western part of the site and 1.25m in the eastern part of the site. The fill material typically comprised sandy silt with some gravel charcoal and a trace of plastic, glass, bricks and/or coal observed at some locations. The fill material was observed to be underlain by residual soils including silt and clay.

Groundwater was not observed in any of the test pits.

7.2 PID Results

PID headspace results ranged up to 49.2ppm. The PID response was slow suggesting that it may have been responding to moisture in the samples rather than volatile ionisable contaminants.

The PID results are presented in Appendix C.

7.3 Laboratory Results

The laboratory analytical report is presented in Appendix D. The soil sample analytical results are summarised in Table 4.

7.3.1 Quality Assurance / Quality Control (QA/QC) Results And Data Usability

Samples were received by Amdel within the recommended holding times and they were chilled at 4°C when received. Copies of the Chain of Custody documentation are included in Appendix D.

A data validation report has been prepared for QA/QC purposes and is presented in Appendix E. The conclusions of the data usability assessment, are presented in Table 3. The data useability assessment revealed that the data is directly useable and reasonably represents conditions at the sampling locations at the time of sampling.

TABLE 3: SUMMARY OF DATA USABILITY ASSESSMENT

Batch No.	Sampling Date	Sample Handling	Precision & Accuracy	Field QA/QC	Lab QA/QC	Data Usability
ALS Batch ES31740	24/1/02	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Directly Useable

TABLE 4
SUMMARY OF LABORATORY RESULTS
(SOIL)
All results in mg/kg

Sample ID		TP2	TP2	TP3	TP4	TP4A	TP5	TP6
Geological Origin	THRESHOLD	Fill	Fill	Fill	Fill	Dup of	Fill	Fill
Date of Sampling	CONCENTRATION	24-Jan-02	24-Jan-02	24-Jan-02	24-Jan-02	TP4	24-Jan-02	24-Jan-02
Depth (m)		0.1-0.35	0.4-0.65	0.25-0.45	0.1-0.3	0.1-0.3	0.25-0.55	0.25-0.45
HEAVY METALS								
Arsenic	20 [1]	6	6	4	3	4	2	2
Cadmium	3 [1]	<1	<1	<1	<1	<1	<1	<1
Chromium	400 [2]	26	42	16	17	16	11	18
Copper	100 [2]	44	3	3	43	44	3	6
Nickel	60 [1]	8	1	<1	24	22	<1	1
Lead	300 [1]	1500	21	14	128	194	10	9
Zinc	200 [2]	510	6	8	220	200	9	9
Mercury in Soil	1 [2]	0.1	<0.1	<0.1	0.4	0.4	<0.1	<0.1
TOTAL PETROLEUM HYDROCARBONS								
C6 - C9 Fraction	65 [3]	<2	-	-	<2	<2	-	<2
C10 - C14 Fraction		<50	-	-	<50	<50	-	<50
C15 - C28 Fraction		<100	-	-	<100	<100	-	<100
C29 - C36 Fraction		<100	-	-	<100	<100	-	<100
Total C10-C36	1000 [3]	ND	-	-	ND	ND	-	ND
BTEX								
Benzene	1 [3]	<0.2	-	-	<0.2	<0.2	-	<0.2
Toluene	130 [3]	<0.2	-	-	<0.2	<0.2	-	<0.2
Ethylbenzene	50 [3]	<0.2	-	-	<0.2	<0.2	-	<0.2
Xylene	25 [3]	<0.4	-	-	<0.4	<0.4	-	<0.4
POLYNUCLEAR AROMATICS								
Naphthalene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	1 [1]	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene		<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Total PAH	20 [1]	ND	-	ND	ND	ND	ND	ND
OTHER								
Asbestos		-	-	-	-	-	-	ND

NOTES:

Concentration exceeds the respective threshold concentration

[1] Based on the Health Based Soil Investigation Level in Column 1 of the NSW EPA (1998) Auditor Guidelines

[2] Based on the Phytotoxicity Based Soil Investigation Level in Column 5 of the NSW EPA (1998) Auditor Guidelines

[3] Based on NSW EPA (1994) Guidelines for Assessing Service Station Sites

- Not Analysed

ND Not Detected

TABLE 4
SUMMARY OF LABORATORY RESULTS
(SOIL)
All results in mg/kg

Sample ID		TP7	TP7	TP8	TP8A	TP9	TP9	TP10
Geological Origin	THRESHOLD	Fill	Fill	Fill	Dup of	Fill	Residual	Residual
Date of Sampling	CONCENTRATION	24-Jan-02	24-Jan-02	24-Jan-02	TP8	24-Jan-02	24-Jan-02	24-Jan-02
Depth (m)		0.0-0.21	0.35-0.55	0.1-0.3	0.1-0.3	0.2-0.4	1.0-1.2	0.1-0.3
HEAVY METALS								
Arsenic	20 [2]	4	6	5	4	5	3	3
Cadmium	3 [2]	<1	<1	<1	<1	<1	<1	<1
Chromium	400 [2]	12	24	18	22	20	25	9
Copper	100 [2]	67	19	5	6	8	6	1
Nickel	60 [2]	6	6	1	1	4	3	<1
Lead	300 [1]	253	100	17	13	11	13	8
Zinc	200 [2]	[redacted]	165	11	11	10	15	4
Mercury in Soil	1 [2]	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TOTAL PETROLEUM HYDROCARBONS								
C6 - C9 Fraction	65 [3]	-	-	-	-	-	-	<2
C10 - C14 Fraction		-	-	-	-	-	-	<50
C15 - C28 Fraction		-	-	-	-	-	-	<100
C29 - C36 Fraction		-	-	-	-	-	-	<100
Total C10-C36	1000 [3]	-	-	-	-	-	-	ND
BTEX								
Benzene	1 [3]	-	-	-	-	-	-	<0.2
Toluene	130 [3]	-	-	-	-	-	-	<0.2
Ethylbenzene	50 [3]	-	-	-	-	-	-	<0.2
Xylene	25 [3]	-	-	-	-	-	-	<0.4
POLYNUCLEAR AROMATICS								
Naphthalene		<0.5	-	-	-	-	-	<0.5
Acenaphthylene		<0.5	-	-	-	-	-	<0.5
Acenaphthene		<0.5	-	-	-	-	-	<0.5
Fluorene		<0.5	-	-	-	-	-	<0.5
Phenanthrene		<0.5	-	-	-	-	-	<0.5
Anthracene		<0.5	-	-	-	-	-	<0.5
Fluoranthene		<0.5	-	-	-	-	-	<0.5
Pyrene		<0.5	-	-	-	-	-	<0.5
Benz[a]anthracene		<0.5	-	-	-	-	-	<0.5
Chrysene		<0.5	-	-	-	-	-	<0.5
Benzo(b)fluoranthene		<0.5	-	-	-	-	-	<0.5
Benzo(k)fluoranthene		<0.5	-	-	-	-	-	<0.5
Benzo(a)pyrene	1 [1]	<0.5	-	-	-	-	-	<0.5
Indeno(1,2,3-cd)pyrene		<0.5	-	-	-	-	-	<0.5
Dibenz(a,h)anthracene		<0.5	-	-	-	-	-	<0.5
Benzo(g,h,i)perylene		<0.5	-	-	-	-	-	<0.5
Total PAH	20 [1]	ND	-	-	-	-	-	ND
OTHER								
Asbestos		-	-	ND	ND	-	-	ND

NOTES:

[redacted] Concentration exceeds the respective threshold concentration

[1] Based on the Health Based Soil Investigation Level in Column 1 of the NSW EPA (1998) Auditor Guidelines

[2] Based on the Phytotoxicity Based Soil Investigation Level in Column 5 of the NSW EPA (1998) Auditor Guidelines

[3] Based on NSW EPA (1994) Guidelines for Assessing Service Station Sites

\- Not Analysed

ND Not Detected

Odorous Sample

TABLE 4
SUMMARY OF LABORATORY RESULTS
(SOIL)
All results in mg/kg

Sample ID		TP10A	TP11	TP12	TP13	TP14	TP14	TP15
Geological Origin	THRESHOLD	Dup of	Fill	Fill	Fill	Fill	Residual	Fill
Date of Sampling	CONCENTRATION	TP10	24-Jan-02	24-Jan-02	24-Jan-02	24-Jan-02	24 Jan 02	24 Jan 02
Depth (m)		0.1-0.3	0.1-0.3	0.0-0.15	0.1-0.3	0.0-0.2	0.8-1.0	0.1-0.3
HEAVY METALS								
Arsenic	20 [2]	<1	4	3	3	3	5	4
Cadmium	3 [2]	<1	<1	<1	<1	<1	<1	<1
Chromium	400 [2]	5	18	11	12	7	20	13
Copper	100 [2]	1	2	10	6	13	6	20
Nickel	60 [2]	<1	<1	3	1	4	2	5
Lead	300 [1]	4	8	44	7	57	11	272
Zinc	200 [2]	3	5	137	10	70	10	100
Mercury in Soil	1 [2]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TOTAL PETROLEUM HYDROCARBONS								
C6 - C9 Fraction	65 [3]	-	-	-	<2	-	-	-
C10 - C14 Fraction		-	-	-	<50	-	-	-
C15 - C28 Fraction		-	-	-	<100	-	-	-
C29 - C36 Fraction		-	-	-	<100	-	-	-
Total C10-C36	1000 [3]	-	-	-	ND	-	-	-
BTEX								
Benzene	1 [3]	-	-	-	<0.2	-	-	-
Toluene	130 [3]	-	-	-	<0.2	-	-	-
Ethylbenzene	50 [3]	-	-	-	<0.2	-	-	-
Xylene	25 [3]	-	-	-	<0.4	-	-	-
POLYNUCLEAR AROMATICS								
Naphthalene		-	<0.5	-	<0.5	-	-	<0.5
Acenaphthylene		-	<0.5	-	<0.5	-	-	<0.5
Acenaphthene		-	<0.5	-	<0.5	-	-	<0.5
Fluorene		-	<0.5	-	<0.5	-	-	<0.5
Phenanthrene		-	<0.5	-	<0.5	-	-	<0.5
Anthracene		-	<0.5	-	<0.5	-	-	<0.5
Fluoranthene		-	<0.5	-	<0.5	-	-	<0.5
Pyrene		-	<0.5	-	<0.5	-	-	<0.5
Benz(a)anthracene		-	<0.5	-	<0.5	-	-	<0.5
Chrysene		-	<0.5	-	<0.5	-	-	<0.5
Benzo(b)fluoranthene		-	<0.5	-	<0.5	-	-	<0.5
Benzo(k)fluoranthene		-	<0.5	-	<0.5	-	-	<0.5
Benzo(a)pyrene	1 [1]	-	<0.5	-	<0.5	-	-	<0.5
Indeno(1,2,3-cd)pyrene		-	<0.5	-	<0.5	-	-	<0.5
Dibenz(a,h)anthracene		-	<0.5	-	<0.5	-	-	<0.5
Benzo(g,h,i)perylene		-	<0.5	-	<0.5	-	-	<0.5
Total PAH	20 [1]	-	ND	-	ND	-	-	ND
OTHER								
Asbestos		ND	ND	ND	-	ND	-	ND

NOTES:

Concentration exceeds the respective threshold concentration

[1] Based on the Health Based Soil Investigation Level in Column 1 of the NSW EPA (1998) Auditor Guidelines

[2] Based on the Phytotoxicity Based Soil Investigation Level in Column 5 of the NSW EPA (1998) Auditor Guidelines

[3] Based on NSW EPA (1994) Guidelines for Assessing Service Station Sites

- Not Analysed

ND Not Detected

Odorous Sample

TABLE 4
SUMMARY OF LABORATORY RESULTS
(SOIL)
All results in mg/kg

Sample ID		BH1	BH2	BH3	BH4	BH5	BH6	BH7
Geological Origin	THRESHOLD	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Date of Sampling	CONCENTRATION	24-Jan-02	24-Jan-02	24-Jan-02	24-Jan-02	24-Jan-02	24-Jan-02	24-Jan-02
Depth (m)		0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3
HEAVY METALS								
Arsenic	20 [2]	7	5	3	4	6	5	4
Cadmium	3 [2]	<1	<1	<1	<1	<1	<1	<1
Chromium	400 [2]	13	11	13	13	16	14	7
Copper	100 [2]	46	[illegible]	14	20	45	35	13
Nickel	60 [2]	7	6	4	9	9	9	3
Lead	300 [1]	[illegible]	[illegible]	213	[illegible]	[illegible]	[illegible]	196
Zinc	200 [2]	[illegible]	[illegible]	78	104	[illegible]	[illegible]	146
Mercury in Soil	1 [2]	0.5	0.2	0.2	0.1	0.2	0.4	0.2
TOTAL PETROLEUM HYDROCARBONS								
C6 - C9 Fraction	65 [3]	-	-	-	-	-	-	-
C10 - C14 Fraction		-	-	-	-	-	-	-
C15 - C28 Fraction		-	-	-	-	-	-	-
C29 - C36 Fraction		-	-	-	-	-	-	-
Total C10-C36	1000 [3]	-	-	-	-	-	-	-
BTEX								
Benzene	1 [3]	-	-	-	-	-	-	-
Toluene	130 [3]	-	-	-	-	-	-	-
Ethylbenzene	50 [3]	-	-	-	-	-	-	-
Xylene	25 [3]	-	-	-	-	-	-	-
POLYNUCLEAR AROMATICS								
Naphthalene		-	-	-	-	-	-	-
Acenaphthylene		-	-	-	-	-	-	-
Acenaphthene		-	-	-	-	-	-	-
Fluorene		-	-	-	-	-	-	-
Phenanthrene		-	-	-	-	-	-	-
Anthracene		-	-	-	-	-	-	-
Fluoranthene		-	-	-	-	-	-	-
Pyrene		-	-	-	-	-	-	-
Benz(a)anthracene		-	-	-	-	-	-	-
Chrysene		-	-	-	-	-	-	-
Benzo(b)fluoranthene		-	-	-	-	-	-	-
Benzo(k)fluoranthene		-	-	-	-	-	-	-
Benzo(a)pyrene	1 [1]	-	-	-	-	-	-	-
Indeno(1,2,3,cd)pyrene		-	-	-	-	-	-	-
Dibenz(a,h)anthracene		-	-	-	-	-	-	-
Benzo(g,h,i)perylene		-	-	-	-	-	-	-
Total PAH	20 [1]	-	-	-	-	-	-	-
OTHER								
Asbestos		-	-	ND	-	-	ND	ND

NOTES:
(shaded) Concentration exceeds the respective threshold concentration
[1] Based on the Health Based Soil Investigation Level in Column 1 of the NSW EPA (1998) Auditor Guidelines
[2] Based on the Phytotoxicity Based Soil Investigation Level in Column 5 of the NSW EPA (1998) Auditor Guidelines
[3] Based on NSW EPA (1994) Guidelines for Assessing Service Station Sites
\- Not Analysed
ND Not Detected
Odorous Sample

Coffey

TABLE 4
SUMMARY OF LABORATORY RESULTS
(SOIL)
All results in mg/kg

Sample ID		BH8	BH9	DUP10	BH11
Geological Origin	THRESHOLD	Fill	Fill	Fill	Fill
Date of Sampling	CONCENTRATION	24-Jan-02	24-Jan-02	24-Jan-02	24-Jan-02
Depth (m)		0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3
HEAVY METALS					
Arsenic	20 [1]	[redacted]	3	3	5
Cadmium	3 [2]	<1	<1	<1	<1
Chromium	400 [2]	8	11	9	16
Copper	100 [2]	16	8	8	11
Nickel	60 [2]	6	2	2	2
Lead	300 [1]	227	133	79	112
Zinc	200 [2]	152	75	45	87
Mercury in Soil	1 [2]	0.2	<0.1	<0.1	<0.1
TOTAL PETROLEUM HYDROCARBONS					
C6 - C9 Fraction	65 [3]	-	-	-	-
C10 - C14 Fraction		-	-	-	-
C15 - C28 Fraction		-	-	-	-
C29 - C36 Fraction		-	-	-	-
Total C10-C36	1000 [3]	-	-	-	-
BTEX					
Benzene	1 [3]	-	-	-	-
Toluene	130 [3]	-	-	-	-
Ethylbenzene	50 [3]	-	-	-	-
Xylene	25 [3]	-	-	-	-
POLYNUCLEAR AROMATICS					
Naphthalene		-	-	-	-
Acenaphthylene		-	-	-	-
Acenaphthene		-	-	-	-
Fluorene		-	-	-	-
Phenanthrene		-	-	-	-
Anthracene		-	-	-	-
Fluoranthene		-	-	-	-
Pyrene		-	-	-	-
Benz(a)anthracene		-	-	-	-
Chrysene		-	-	-	-
Benzo(b)fluoranthene		-	-	-	-
Benzo(k)fluoranthene		-	-	-	-
Benzo(a)pyrene	1 [1]	-	-	-	-
Indeno(1.2.3.cd)pyrene		-	-	-	-
Dibenz(a.h)anthracene		-	-	-	-
Benzo(g.h.i)perylene		-	-	-	-
Total PAH	20 [1]	-	-	-	-
OTHER					
Asbestos		ND	ND	ND	ND

NOTES:
[redacted] Concentration exceeds the respective threshold concentration
[1] Based on the Health Based Soil Investigation Level in Column 1 of the NSW EPA (1998) *Auditor Guidelines*
[2] Based on the Phytotoxicity Based Soil Investigation Level in Column 5 of the NSW EPA (1998) *Auditor Guidelines*
[3] Based on NSW EPA (1994) *Guidelines for Assessing Service Station Sites*
- *Not Analysed*
ND *Not Detected*
Odorous Sample

7.4 Comparison of Results with Threshold Concentrations

The following exceedances of the threshold concentrations discussed in Section 5 were observed for soil samples:

- Lead in TP2 0.1-0.35 (335mg/kg), BH1 0.0-0.3 (336mg/kg), BH2 0-0.3 (435mg/kg), BH4 0-0.3 (320mg/kg), BH5 0-0.3 (327mg/kg) and BH6 0-0.3 (671mg/kg) compared to the human health based threshold concentration of 300mg/kg;
- Arsenic in BH8 0-0.3 (30mg/kg) compared to the phytotoxicity based threshold concentration of 20mg/kg but below the human health based threshold concentration of 100mg/kg;
- Copper in BH2 0-0.3 (219mg/kg) compared to the phytotoxicity based threshold concentration of 100mg/kg but below the human health based threshold concentration of 1000mg/kg;
- Zinc in TP2 0.1-0.35 (358mg/kg), TP4 0.1-0.3 (220mg/kg), TP4A 0.1-0.3 (308mg/kg), TP7 0-0.21 (372mg/kg), BH1 0-0.3 (296mg/kg), BH2 0-0.3 (228mg/kg), BH5 0-0.3 (264mg/kg) and BH6 0-0.3 (211mg/kg) compared to the phytotoxicity based threshold concentration of 200mg/kg but well below the human health based threshold concentration of 7000mg/kg;

TPH, BTEX, PAHs and asbestos were not detected in any of the samples analysed. Other heavy metals were detected, but below both the human health and phytotoxicity based threshold concentrations.

8. DISCUSSION

The site history study revealed that the site contained residential cottages for workers of the Commonwealth Portland Cement Works since the early 1900s. Based on the site history review, the following potential areas of environmental concern (AECs) were identified:

- Leaching or weathering of contaminants potentially contained in building material;
- Potential burial of fill material;
- Potential onsite migration of contaminants from adjacent properties.

In order to assess the above AECs for the presence of contamination, a field investigation was undertaken comprising the collection of soil samples from eleven hand auger holes and fifteen test pits auger holes at selected locations. A total of twenty-nine soil samples (plus three duplicate samples and one wash blank) collected during the field investigation were subjected to laboratory analysis for chemicals of concern.

The following subsections present separate discussions on the different AECs.

8.1 Leaching / Weathering of Hazardous Building Materials

Hazardous materials potential contained in building materials on the site and which could potentially leach or weather into surface soil could include lead from lead based paint, zinc from galvanised corrugated iron and asbestos from fibro.

The cottages on the site are of constructed of brick which has been painted. Taking into account the age of the buildings, it is considered likely that they would have been painted with lead based paint. A substantial proportion of the paint was observed to be peeling. In addition, a number of sheds located in the backyards of the site and the rooves of the cottages were constructed of corrugated iron.

In order to assess the presence of lead and zinc in soil as a result of weathering and/or leaching of lead based paint and corrugated iron, twenty-five near surface soil samples collected from the site, including some from immediately adjacent to cottages and sheds, were tested for heavy metals. A further four deeper samples were also analysed for heavy metals to assess the vertical extent of contamination.

Lead was detected in six of the near surface soil samples analysed at concentrations exceeding the human health based threshold concentrations applicable to residential sites with gardens and accessible soil. This suggests that lead concentrations in near surface soil could potentially pose a risk to human health in a residential setting with gardens and accessible soil.

Zinc was also detected in seven and copper and arsenic in one of the near surface soil samples analysed at concentrations exceeding the provisional respective phytotoxicity based threshold concentrations but well below the human health based threshold concentrations. This suggests that the near surface soil could potentially be phytotoxic to plants.

Taking into account that concentrations of heavy metals in soil samples collected from deeper than around 0.3m were below both the human health and phytotoxicity based threshold concentrations, it is considered that heavy metal contamination is likely to be limited to near surface soil (less than about 0.3m depth) and is likely to predominantly be the result of weathering/leaching of heavy metals from materials used in buildings.

Taking into account the above, it is considered that remediation and/or management of heavy metal contamination in near surface soils at the site is required for the site to be suitable for residential use with gardens and accessible soil.

A number of annexes of the cottages were observed to be constructed with fibro board which could potentially contain asbestos. In addition, it is not known if the cottages which have been demolished in the western part of the site contained asbestos. In order to assess for the presence of asbestos fibres in soil as a result of weathering of asbestos containing building materials, fourteen near surface soil samples collected from the site, including from adjacent to fibro annexes, were tested for asbestos. Asbestos was not detected in any of these samples. Taking into account that asbestos was not detected in any of the samples tested and that visual evidence of asbestos (such as fibro board fragments) was not observed in any of the test pits or hand auger holes, the likelihood of widespread asbestos contamination being present as a result of weathering of asbestos containing building materials on the site is considered to be low.

8.2 Fill Material

Test pits and hand-auger holes across the site encountered fill material ranging in thickness from 0.1m to 0.75m in the western part of the site and 1.25m in the eastern part of the site. The fill typically comprised sandy silt with some gravel, charcoal and trace plastic, glass, bricks and coal observed at some locations.

Overall, twenty-six soil samples collected from the fill material were subjected to laboratory analysis. Many of these samples were also near-surface samples. Four fill samples were analysed for TPH and BTEX, nine for PAH, twenty-six for heavy metals and thirteen for asbestos.

Heavy metals were detected at concentrations exceeding the human health and phytotoxicity based threshold concentrations, but as discussed in Section 8.1 all of these exceedances were in near surface samples and are considered likely to be associated of leaching/weathering of hazardous building materials. TPH, BTEX, PAH and asbestos were not detected in any of the samples analysed.

Taking into account the above discussion, the likelihood of fill material at the site containing significant contamination exceeding criteria for residential sites with gardens and accessible soil is considered to be low.

8.3 On Site Migration of Contamination

Potential offsite sources of contamination include:

- A service station located across Willawa Street to the south of the site;
- The Cement Works Facilities located to the east of the site including a workshop to the north of the eastern part of the site;
- The annex building located between the western and eastern parts of the site which was formerly used as a munitions store.

Taking into account the topography of the site and surrounding land, the distance of the cements works facilities from the site and that no visual or olfactory evidence of contamination was identified in any of the test pits or hand auger holes, the likelihood of significant onsite migration of contaminants from offsite sources is considered to be low.

9. CONCLUSIONS AND RECOMMENDATIONS

Based on the above, it is considered that the site is likely to be suitable for the proposed residential use with gardens and accessible soil (home grown produce contributing less than 10% fruit and vegetable intake, no poultry) subject to:

- Further delineation then remediation and/or management of heavy metal contamination in near surface soil across the site;
- Undertaking a hazardous materials assessment of remaining buildings on the site and managing any hazardous materials identified appropriately to prevent recontamination of near surface soils.

It is recommended that additional sampling and analysis be undertaken by Coffey or another suitably qualified environmental consultant to further assess the extent of heavy metal in near surface soil. Following the additional sampling and analysis, it is recommended that a remediation action plan (RAP) be prepared outlining remediation and validation procedures for the heavy metal contaminated near surface soil.

It is considered that the most feasible remediation option for the heavy metal contaminated soil is likely to be excavation of the contaminated material and then either offsite disposable of the material to a suitably licensed landfill or reuse of the material on a part of the cement works which will be used for less sensitive use such as commercial/industrial.

Prior to removal of the soil from the site it would need to be classified in accordance with the NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.

It is important to note that contamination hotspots not detected during this investigation may be present on the site. If during redevelopment of the site suspicious material (e.g. oily or odorous material, drums, tanks, metal or plastic chemical containers, ash, coke or brightly coloured material) are encountered, work in that part of the site should cease and advice should be sought from Coffey or another suitably qualified environmental consultant.

10. LIMITATIONS

The findings contained within this report are the result of discrete/specific sampling methodologies used in accordance with normal practices. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

11. REFERENCES

NSW EPA (1999). *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes*

NSW EPA (1997). *Guidelines for Consultants Reporting on Contaminated Sites*

NSW EPA (1998). *Guidelines for the NSW Site Auditor Scheme*

NSW EPA (1995). *Sampling Design Guidelines for Contaminated Sites.*

NSW EPA (1994). *Guidelines for Assessing Service Station Sites.*

Peter Fenwick (1993). *A Heritage Assessment of the Portland Cement Works*, prepared for Blue Circle Southern Cement Limited

For and on behalf of

COFFEY GEOSCIENCES PTY LTD

ROSS BEST
Senior Principal

JOSHUA LASKY
Project Manager

Information

Important information about your **Coffey** Environmental Site Assessment

Coffey

Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your environmental site assessment report.

Your report has been written for a specific purpose

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an on-going operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man and may change with time. For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project and/or on the property.

Interpretation of factual data

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment of on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

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Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

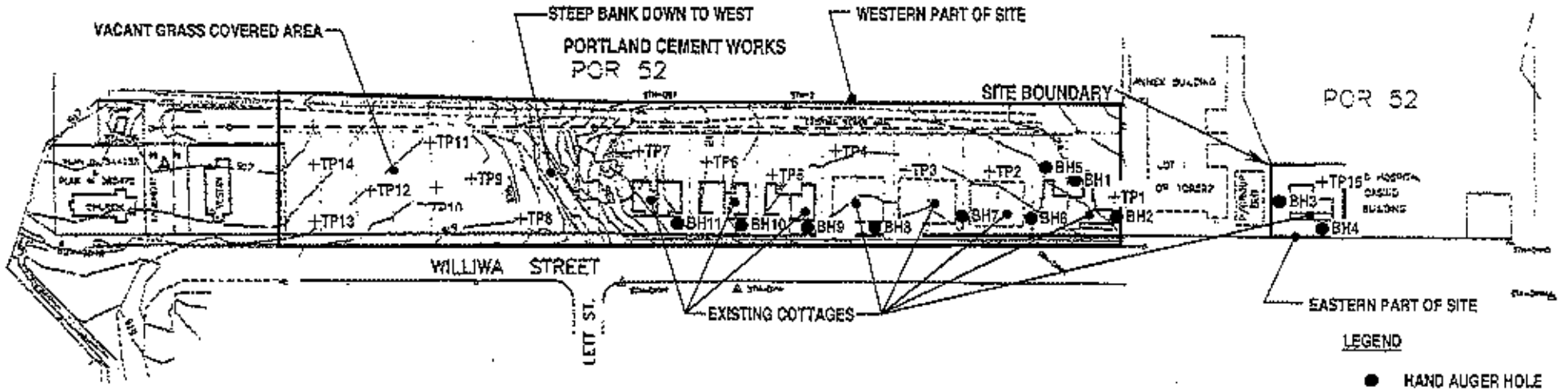
Logs, figures, laboratory data, drawings etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Contact Coffey for additional assistance

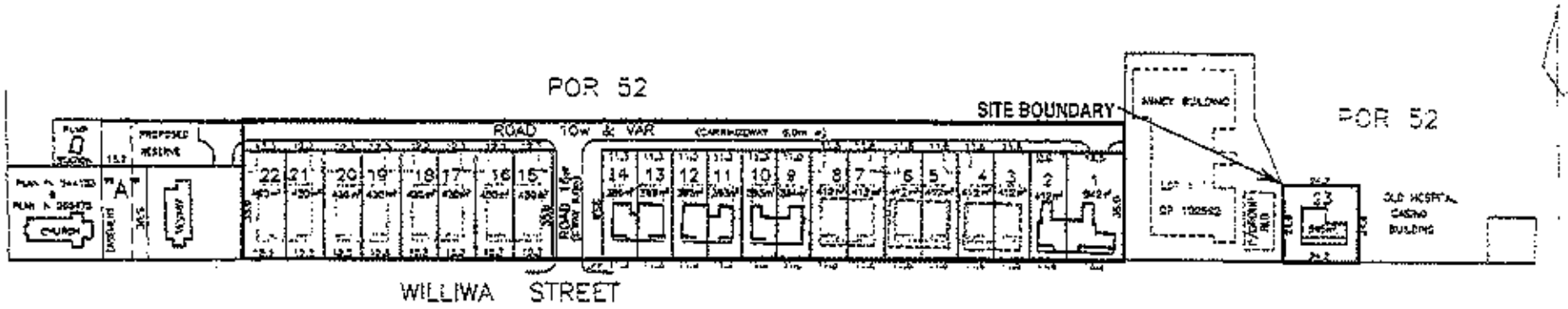
Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.



PLAN SHOWING CURRENT SITE FEATURES & SAMPLING LOCATIONS



PLAN SHOWING PROPOSED SUBDIVISION LAYOUT

Coffey Geosciences Pty Ltd ACN 056 335 516		Geotechnical | **Resources** | Environmental | **Technical** | Project Management	
Drawn	JML/SW	BARRY COSIER SOLICITORS ENVIRONMENTAL SITE ASSESSMENT PROPOSED RESIDENTIAL SUBDIVISION, WILLIWA STREET, PORTLAND CURRENT & PROPOSED SITE PLANS	FIGURE 1
Approved	JML		
Date	4/11/02		
Scale	1:2000 approx		Job no: E12591/1

Coffey

APPENDIX A

EPA NOTICES

CERTIFIED MAIL
Blue Circle Southern Cement Ltd
P O BOX 42

WENTWORTHVILLE NSW 2145

Our Reference: 260141/D1/ Not. Nos. 002046

Your Reference: UBL # 3118; Notice # 410

17 AUG1995

NOTICE UNDER SECTION 35

OF THE ENVIRONMENTALLY HAZARDOUS CHEMICALS ACT 1985

WHEREAS -

A. Blue Circle Southern Cement Limited (BCSC) is the occupier of premises at Williwa Street Portland more fully described in the Schedule and known as Portland Cement Works (the 'premises').

B. The Environment Protection Authority (EPA) has reasonable grounds to believe that soil and water on the premises are contaminated with heavy metals and may be contaminated with polycyclic aromatic hydrocarbons (PAHs) as a consequence of cement manufacturing and associated operations on the premises.

In accordance with the powers vested in the EPA by the provisions of Part 5 of the Environmentally Hazardous Chemicals Act 1985 and section 35 in particular, the EPA directs BCSC to:

1. Prepare and submit to the EPA by 17 October 1995 a draft sampling and analysis protocol. The draft protocol should be prepared by suitably qualified persons and include a proposed timetable not extending beyond 17 January 1996 for sampling and analysis of waters, soil and sediment and carrying out a hydrological study over the whole premises in the manner described in this notice:

a) all sampling and analysis must be carried out in accordance with:(i) "Test Methods for Evaluating Solid Waste" (SW-836), 4th Edition (1992), Office of Solid Waste and Emergency Response, USEPA, or a NATA endorsed complementary method; or (ii) "Standard Methods for Analysis of Water and Wastewater" American Public Health Association (APHA), 18th Edition (1992).

2. Upon approval by the EPA and in accordance with the draft protocol as amended, if relevant, collect samples of water, soil and sediment from all surface waters, the floor sediments of all water filled quarries and storages, and all fly ash handling and storage areas on the premises. Samples must be taken prior to any removal of surface or subsurface contamination. The samples shall be analysed for a range of organic and inorganic species. The analysis shall include a full range of metal species, PAHs, organochlorines and total phenolic compounds.

3. Submit to the EPA by 17 January 1996 one or more reports:

(a) detailing the dates and locations of all sampling, the results of the analyses and their interpretation; and

(b) indicating the relationships between groundwater, the water currently in the quarries, and surface waters.

4. Prepare and submit to the EPA by 17 January 1996 a draft remediation plan, including consideration of on-going monitoring both on and off-site.

5. The EPA must be notified in writing at least 2 months prior to any dealings or proposed dealings affecting the land title to the premises or the tenure of BCSC, including with regard to the renewal, transfer or request for cancellation of any authority under the Mining Act 1992.

Note: If you neglect or fail to comply with this notice, you may be prosecuted for breaching section 35(1) of the Environmentally Hazardous Chemical Act.

NEIL SHEPHERD

Director General

(signed 17/08/1995)

per

RICHARD WHYTE

REGIONAL MANAGER

CENTRAL WEST

(By Authorisation)

SCHEDULE

Land including:

Lot 1 DP 842890 Lot 2 DP 749903 Lot 3 DP 749905 Lot 4 DP 749906 Lot 5 DP 749907 Lot 6 DP 749908 Lot 7 DP 749909 Lot 1 DP 109595 lot 24 Sec 46 DP 758855 Por 53 Por 104 Por 174 Part Por 52 PO 57/15 PO 79/3 ML 195 ML 411 ML 804 PLL 1132 ML 2806 ML 2851 ML 2906 ML 2941 ML 5673 PLL 953 ML 410 MPL 1098 ML 3263 PLL 3576 ML 306 MPL 393 ML 2949 ML 3177 ML 3208 ML 3209 ML 2851

cc Greater Lithgow City Council and Department of Mineral

Resources

REGISTERED MAIL

General Manager
Blue Circle Southern Cement Ltd
Powers Road
SEVEN HILLS NSW 2147

ENVIRONMENTALLY HAZARDOUS CHEMICALS ACT, 1985
NOTICE UNDER SECTION 35

WHEREAS:-

A. Blue Circle Southern Cement Ltd (ACN 008 421 761) is the occupier of the premises located at Williwa Street Portland, more fully described in the Schedule and known as Portland Cement Works (the 'premises').
B. The premises were deemed to be contaminated with heavy metals and polycyclic aromatic hydrocarbons (PAHs) in soils and waters, as a consequence of cement manufacturing and associated operations on the premises.
C. Notice number 410 pursuant to Section 35 of the Environmentally Hazardous Chemicals Act 1985 was served on Blue Circle Southern Cement Ltd, the occupier of the premises, on 17 August 1995. The notice specified requirements for the investigation of soil, water and sediment contamination, and the subsequent preparation of a draft remediation plan.
D. All the conditions of Notice No. 410 have been complied with.

TAKE NOTE THAT:

In accordance with the powers vested in the Environment Protection Authority (EPA) by the provisions of Section 35 of the Environmentally Hazardous Chemicals Act 1985, the EPA hereby revokes Notice number 410 dated 17 August 1995.

NEIL SHEPHERD
Director-General

(signed 6 Oct 1999)

CATHY DYER
Manager Contaminated Sites
(by delegation)

ec. EPA CLM Act record
EPA Regional Manager Central West
Lithgow City Council

NOTE:

The EPA must be notified in writing at least two months prior to any dealings or proposed dealings affecting the land title to the premises or the tenure of Blue Circle Southern Cement, including with regard to the renewal, transfer or request for cancellation of any authority under the Mining Act 1992.

SCHEDULE:

Land including:

Lot 1 DP 842890 Lot 2 DP 749903 Lot 3 DP 749905 Lot 4 DP 749906 Lot 5 DP 749907 Lot 6 DP 749908 Lot 7 DP 749909 Lot 1 DP 109595 Lot 24 sec 46 DP 758855 por 53 por 104 por 174 part por 52 PO 57/15 PO 79/3 ML 195 ML 411 ML 804 PLL 1132 ML 2806 ML 2851 ML 2906 ML 2941 ML 5673 PLL 953 ML 410 MPL 1098 ML 3263 PLL 3576 ML 306 MPL 393 ML 2949 ML 3177 ML 3208 ML 3209 ML 2851

APPENDIX B

TEST PIT AND HAND AUGER HOLE LOGS

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Soil Description

Explanation Sheet 1 (of 2)

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DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil.

Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 µm to 2.36 mm
	medium	200 µm to 600µm
	fine	75 µm to 200 µm

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH c_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 – 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 – 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 – 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 – 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	–	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 – 35
Medium Dense	35 – 65
Dense	65 – 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: < 5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 – 12% Fine grained soils: 15 – 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely weathered material — Structure and fabric of parent rock visible.

Residual soil — Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil — Deposited by wind.

Alluvial soil — Deposited by streams and rivers.

Colluvial soil — Deposited on slopes (transported downslope by gravity).

Fill — Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.

Lacustrine soil — Deposited by lakes.

Marine soil — Deposited in ocean basins, bays, beaches and estuaries.

Form No. GD05.5 Issue 3. Rev. 2

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. BH1

Sheet 1 of 1

Office Job No.: E12591/1

Engineering Log - Borehole

Client: *Barry F Cosier Solicitors*

Date started: *24.1.2002*

Principal:

Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*

Logged by: *KME/JB*

Borehole Location: *Refer to Figure 1*

Checked by: JML

drill model and mounting: HAND AUGER | Casing: | slope: -90° | R.L. Surface:

hole diameter: mm | Northing: | bearing: - | datum:

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA			None	E					FILL: SILT Dark brown, with some fine to medium grained sand. Some fine to coarse grained gravel comprising siltstone, trace of limestone, shale and charcoal. Some wood fragments and roots. Ants nest.	M			FILL
						0.5			Borehole BH1 terminated at 0.3m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

BOREHOLE S:\12591\1.GPJ COFFEY.GDT 04.02.02

Form GEO 6.3 Issue 3 Rev 2

method
- AS auger screwing*
- AD auger drilling*
- RR roller/cone
- W washbore
- CT cable tool
- HA hand auger
- DT dialube
- B blank bit
- V V bit
- T TC bit
- *bit shown by suffix e.g. ADT

support
- M mud
- N nil
- C casing

penetration
- 1 2 3 4
- no resistance
- ranging to refusal

water
- 10/1/98 water level on date shown
- water inflow
- water outflow

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- V vane shear (kPa)
- P pressuremeter
- Bs bulk sample
- E environmental sample
- R refusal

classification symbols and soil description based on Unified classification system

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- W_L liquid limit

consistency/density index
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. **BH2**

Engineering Log - Borehole

Sheet 1 of 1
Office Job No.: *E12591/1*

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Borehole Location: *Refer to Figure 1*
Checked by: JMC

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:
hole diameter: mm | Northing | bearing: - | datum:

drilling information						material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA		N	None	E		0.0			FILL: SILT Brown, some roots, trace of fine to medium gravel comprising ironstone. Trace of quartz pebbles, cement and limestone.	M			FILL
						0.3			Borehole BH2 terminated at 0.3m				
						0.5							
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

method
AS auger screwing*
AD auger drilling*
RR rollercone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. ADT

support
N nil
M mud
C casing

penetration
1 2 3 4
no resistance
ranging to refusal

water
10/1/02 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_l liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Form GEO 5.2 Issue 3 Rev 2 BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Coffey Geosciences Pty Ltd ACN 056 335 516

Engineering Log - Borehole

Borehole No. BH3

Sheet 1 of 1

Office Job No.: E12591/1

Client: Barry F Cosier Solicitors

Date started: 24.1.2002

Principal:

Date completed: 24.1.2002

Project: Environmental Site Assessment, Willawa Street, Portland

Logged by: KME/JB

Borehole Location: Refer to Figure 1

Checked by: JML

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:

hole diameter: mm | Northing | bearing: - | datum:

drilling information						material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA		N	None	E					FILL: SILT Brown, Some roots, trace of glass and charcoal, one small shell. Becoming cream @ 0.2m	M			FILL
						0.5			Borehole BH3 terminated at 0.3m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

method: AS auger screwing*; AD auger drilling*; RR roller/tricone; W washbore; CT cable tool; HA hand auger; DT diatube; B blank bit; V V bit; T TC bit; *bit shown by suffix e.g. ADT

support: M mud; C casing; N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/08 water level on date shown; water inflow; water outflow

notes, samples, tests: U_{50} undisturbed sample 50mm diameter; U_{63} undisturbed sample 63mm diameter; D disturbed sample; N standard penetration test (SPT); N* SPT - sample recovered; Nc SPT with solid cone; V vane shear (kPa); P pressuremeter; Bs bulk sample; E environmental sample; R refusal

classification symbols and soil description based on unified classification system

moisture: D dry; M moist; W wet; Wp plastic limit; W_L liquid limit

consistency/density index: VS very soft; S soft; F firm; St stiff; VSt very stiff; H hard; Fb friable; VL very loose; L loose; MD medium dense; D dense; VD very dense

Form GEO 5.3 Issue 3 Rev 2

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. **BH4**

Engineering Log - Borehole

Sheet 1 of 1
Office Job No.: **E12591/1**

Client: *Barry F Cosier Solicitors*
Date started: **24.1.2002**

Principal:
Date completed: **24.1.2002**

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: **KME/JB**

Borehole Location: *Refer to Figure 1*
Checked by: jmL

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:
hole diameter: mm | Northing | bearing: - | datum:

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	R.L.	depth metres	graphic log	classification symbol	material: soil type; plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA		N	None	E		0.0			FILL: SILT Brown some fine grained sand, some medium gravel comprising charcoal, limestone. Some roots, trace of orange medium plasticity clay	M			FILL
									Some white fine to coarse sand comprised of shattered limestone pieces @ 0.15m				RESIDUAL
									CLAY: Low to medium plasticity orange with red mottles, trace of white limestone fragments.				
						0.5			Borehole BH4 terminated at 0.3m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev 2

method
AS auger screwing*
AD auger drilling*
RR roller/cone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
N nil
M mud
C casing

penetration
1 2 3 4
no resistance
rocking or vibration
refusal

water
10/1/96 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on Unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. BH5

Sheet 1 of 1

Engineering Log - Borehole

Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*

Date started: *24.1.2002*

Principal:

Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*

Logged by: *KME/JB*

Borehole Location: *Refer to Figure 1*

Checked by: JMC

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:

hole diameter: mm | Northing | bearing: - | datum:

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth (metres)	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 400	structure and additional observations
HA		N	None	E		0.5			FILL: SILT Brown trace of fine grained sand, trace of roots, trace of fine to medium gravel comprising charcoal and siltstone. Trace of coarse grained sandstone. Trace of limestone fragment to 50mm	M			FILL
				E					FILL: GRAVELLY SILT Cream Gravel comprises siltstone and coarse grained sandstone, trace of charcoal.				
									Borehole BH5 terminated at 0.6m				

1.0 1.5 2.0 2.5 3.0 3.5 4.0

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev 2

method

AS	auger screwing*
AD	auger drilling*
RR	rotary/tricone
W	washbore
CT	cable tool
HA	hand auger
DT	diatube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

M mud N nil
C casing

penetration

1 2 3 4 - no resistance - rig/feed to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. BH6

Sheet 1 of 1

Engineering Log - Borehole

Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*

Date started: *24.1.2002*

Principal:

Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*

Logged by: *KME/JB*

Borehole Location: *Refer to Figure 1*

Checked by: *[illegible]*

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:

hole diameter: mm | Northing | bearing: - | datum:

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA		N	None	E		0.0			FILL: SILTY CLAY Low plasticity, dark brown some fine to coarse gravel comprising coal, charcoal, and siltstone. Trace of roots and ash, trace of medium plasticity, orange pods of clay.	M			FILL
						0.5			FILL: CLAY Medium to high plasticity, light brown with orange mottles. Some black ash and charcoal. CLAY: Medium to high plasticity, orange, trace of coarse gravel comprising siltstone.				RESIDUAL
				E		1.0			Borehole BH6 terminated at 0.8m				
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

method

AS	auger screwing*
AD	auger drilling*
RR	rotary/core
W	washbore
CT	cable tool
HA	hand auger
DT	diatube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

N nil | M mud | C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water

▼ 10/1/90 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev 2

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. BH7

Sheet 1 of 1

Office Job No.: E12591/1

Engineering Log - Borehole

Client: *Barry F Cosier Solicitors*

Date started: *24.1.2002*

Principal:

Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*

Logged by: *KME/JB*

Borehole Location: *Refer to Figure 1*

Checked by: JRL

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:

hole diameter: mm | Northing | bearing: - | datum:

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type; plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA		N	None	G		0.5			FILL: GRAVELLY SILT Dark brown with trace of fine grained sand, Gravel fine to coarse, comprising limestone, and trace of siltstone.	M			FILL
									FILL: SILT Cream, trace of black ash.				
				E					Trace of low plasticity clay and trace of medium to fine gravel. Comprising of limestone and shale @ 0.5m				
						1.0			Borehole BH7 terminated at 0.75m				
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

method
AS auger screwing*
AD auger drilling*
RR roller/cone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. AD/T

support
M mud N nil
C casing
penetration 1 2 3 4 no resistance ranging to refusal
water
WS/WB water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev2

Coffey Geosciences Pty Ltd ACN 056 335 518

Borehole No. *BH8*

Engineering Log - Borehole

Sheet 1 of 1
Office Job No.: *E12591/1*

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Borehole Location: *Refer to Figure 1*
Checked by: *JRL*

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:
hole diameter: mm | Northing | bearing: - | datum:

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa (100 200 300 400)	structure and additional observations
HA		N	None	E		0.0			FILL: SILT Brown some roots, trace of fine to medium gravel comprising concrete. Siltstone and trace of glass and charcoal.	M			FILL
				E		0.5			SILT: Cream, some fine to coarse gravel comprising siltstone.				RESIDUAL
									Borehole BH8 terminated at 0.65m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev 2

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4
no resistance
rimpling to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. BH9

Sheet 1 of 1

Engineering Log - Borehole

Office Job No.: E12591/1

Client: Barry F Cosier Solicitors

Date started: 24.1.2002

Principal:

Date completed: 24.1.2002

Project: Environmental Site Assessment, Willawa Street, Portland

Logged by: KME/JB

Borehole Location: Refer to Figure 1

Checked by: JMB

drill model and mounting: HAND AUGER | casing: | slope: -90° | R.L. Surface:

hole diameter: mm | Northing | bearing: ° | datum:

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA		N	None	E					FILL: SILT Grey, trace of roots, trace of fine to medium gravel comprise siltstone and sandstone, glass and charcoal. Becoming cream @ 0.2m	M			FILL
				E		0.5			GRAVELLY SILT: Gravel is fine to coarse comprise siltstone with trace of limestone. Siltstone pieces up to 60mm				RESIDUAL
									Borehole BH9 terminated at 0.7m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev 2

method
- AS auger screwing*
- AD auger drilling*
- RR roller/tricone
- W washbore
- CT cable tool
- HA hand auger
- DT diatube
- B blank bit
- V V bit
- T TC bit
- *bit shown by suffix e.g. ADT

support
- M mud
- N nil
- C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water
- 10/1/98 water level on date shown
- water inflow
- water outflow

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- V vane shear (kPa)
- P pressuremeter
- Bs bulk sample
- E environmental sample
- R refusal

classification symbols and soil description based on Unified classification system

moisture
- D dry
- M moist
- W wet
- W_p plastic limit
- W_L liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Borehole No. **BH10**

Engineering Log - Borehole

Sheet 1 of 1
Office Job No.: *E12591/1*

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Borehole Location: *Refer to Figure 1*
Checked by: *JMC*

drill model and operating: HAND AUGER — Easting: — slope: -90° — R.L. Surface:
hole diameter: mm — Northing — bearing: - — datum:

drilling information							material substance					
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA		N	None	E					FILL: SILT brown with some fine to coarse gravel comprising siltstone. Trace of ash.	M			FILL
						0.5			Borehole BH10 terminated at 0.3m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

BOREHOLE E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev 2

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4 no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
B standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 515

Borehole No. BH11

Engineering Log - Borehole

Sheet 1 of 1

Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*

Date started: 24.1.2002

Principal:

Date completed: 24.1.2002

Project: *Environmental Site Assessment, Willawa Street, Portland*

Logged by: KME/JB

Borehole Location: *Refer to Figure 1*

Checked by: JML

drill model and mounting: HAND AUGER | Easting: | slope: -90° | R.L. Surface:

hole diameter: mm | Northing | bearing: - | datum:

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
HA			None	E					FILL: SILT Grey/brown trace of fine grained sand. Some fine to coarse gravel comprising siltstone. Trace of quartz pebbles, charcoal and roots.	M			FILL
									GRAVELLY SILT: Gravel is fine to coarse comprising siltstone. Becoming cream @ 0.3m				RESIDUAL
						0.5			Borehole BH11 terminated at 0.3m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

BOREHOLE #12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.3 Issue 3 Rev 2

method

AS	auger screwing*
AD	auger drilling*
RR	roller/cone
W	washbore
CT	cable tool
HA	hand auger
DT	diatube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

M mud N nil
C casing

penetration

1 2 3 4 no resistance ranging to refusal

water

10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description based on Unified classification system

moisture

D	dry
M	moist
W	wet
W_p	plastic limit
W_l	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP1

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Coster Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JML

equipment type and model: | Pit Orientation: - | Easting: m | R.L. Surface: NM
excavation dimensions: m long m wide | Northing: m | datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E		0.5			FILL: TOPSOIL Sandy silt, grey-brown, sand is coarse grained comprising limestone, some roots. FILL: SILT Grey some charcoal, trace of ash, trace of roots, one worm, one green 10cm diameter crockery plate. SILT Cream, trace of roots, trace of charcoal.	M			FILL
				E		1.0			CLAY: Medium plasticity, orange brown with red-brown mottles, trace of roots, trace of coarse gravel comprising limestone.				RESIDUAL
						1.5			Test pit TP1 terminated at 1.3m				
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev 2

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration
1 2 3 4
no resistance ringing to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on Unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP2

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JBC

Coffey

equipment type and model: BACKHOE — Pit Orientation: - — Easting: m — R.L. Surface: NM
excavation dimensions: 2.5m long 0.6m wide — Northing: m — datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E		0.5			FILL: TOPSOIL Sandy silt, dark grey and brown, sand is fine grained, some roots, charcoal, fine gravel comprising sandstone.	M			FILL
				E					FILL: SILTY GRAVEL Cream, fine to coarse grained, gravel comprises limestone and siltstone, quart pebbles and sandstone, stream water pipe @ 0.4m				
				E		1.0			FILL: SANDY SILT Dark grey and brown, sand is fine grained, some fine gravel comprising charcoal, limestone and brick fragments, some roots, one bicycle tyre inner tube.				RESIDUAL
									CLAY: Medium plasticity, pale grey with abundant orange-brown and red mottles traces of roots.				
						1.5			Test pit TP2 terminated at 1.3m				
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev 2

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration 1 2 3 4 — no resistance ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP3

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JML

equipment type and model: BACKHOE Pit Orientation: - Easting: m R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide Northing: m datum:

excavation information						material substance					
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E	0.5			FILL: TOPSOIL Gravelly silt, dark grey and brown. Gravel is fine grained comprising limestone quartz and charcoal fragments, some roots, trace of plastic. SILT Cream, some coarse sand to fine gravel sized limestone and quartz fragments, trace of roots and clay.	M			FILL
					1.0			CLAY: Medium plasticity, pale grey with abundant red-brown mottles, trace of roots and trace of coarse gravel comprising limestone.				RESIDUAL
				E	1.5			Test pit TP3 terminated at 1.4m				
					2.0							
					2.5							
					3.0							
					3.5							
					4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 base 3 Rev.2

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N Nil

penetration 1 2 3 4
no resistance
ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry
M moist
W wet
Wp plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 050 335 518

Excavation No. TP4

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JMC

Coffey

equipment type and model: BACKHOE Pit Orientation: - Easting: m R.L. Surface: NA

excavation dimensions: 2m long 0.6m wide Northing: m datum:

excavation information							material substance					
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E E		0.5 1.0			FILL: SILTY GRAVEL Dark grey and brown. Gravel is fine to medium compding coal, limestone, charcoal and siltstone fragments, trace of roots. FILL: ASH LAYER SILT Cream, some coarse sand and fine grained sized gravel, comprising quartz and siltstone fragments. CLAY: Medium plasticity, orange-brown with red-brown mottles, trace of roots.	M			FILL RESIDUAL
						1.5 2.0 2.5 3.0 3.5 4.0			Test pit TP4 terminated at 1.4m				

Sketch

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- S shoring
- N nil

penetration 1 2 3 4 — no resistance ranging to refusal

water
- water level on date shown
- water inflow
- water outflow

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- V vane shear (kPa)
- Bs bulk sample
- E environmental sample
- R refusal

classification symbols and soil description based on unified classification system

moisture
- D dry
- M moist
- W wet
- W_p plastic limit
- W_L liquid limit

consistency/density index
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

Form GEO 5.2 Issue 3 Rev 2

"E5TRIT E12591.GPJ COFFEY.GDT 04.02.02

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP5

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Stroet, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JML

equipment type and model: BACKHOE | Pit Orientation: - | Easting: m | R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide | Northing: m | datum:

excavation information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E		0.5			FILL: GRAVELLY SILT Grey, fine to medium gravel, comprising siltstone. Some roots and wood fragments, trace of charcoal, ash and plastic, one peg and to whole bricks.	M			FILL
				E		1.0			SILT Cream, trace of fine to coarse grained sand, trace of roots.				RESIDUAL
									CLAY: Medium plasticity, red-brown with some yellow mottles.				
						1.5			Test pit TP5 terminated at 1.4m				
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 4.2 Issue 3 Rev.6

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration
1 2 3 4
1 no resistance
2 ranging to
3 refusal
4

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_l liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP6

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JML

equipment type and model: BACKHOE Pit Orientation: - Easting: m R.L. Surface: NM

excavation dimensions: 2m long 0.6m wide Northing: m datum:

excavation information						material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetro-meter kPa	structure and additional observations
BH		N	None Observed	E B	0.5 1.0 1.5 2.0			FILL: TOPSOIL Gravelly silt, grey, gravel is fine comprising coal and limestone. Some roots. FILL: ASH LAYER Pale grey-white, some charcoal. SANDY SILT Grey to cream, sand is fine to medium grained, trace of roots, one worm, trace of fine gravel comprising siltstone. Becoming orange-brown @ 0.4m CLAY: Orange-brown with abundant red-brown mottles, trace of roots, trace of fine gravel comprising quartz and limestone pebbles.	M		100 200 300 400	FILL RESIDUAL
					2.0 2.5 3.0 3.5 4.0			Test pit TP6 terminated at 2m				

Sketch

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration 1 2 3 4
no resistance ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev 2

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP7

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JMC

Coffey

equipment type and model: BACKHOE
Pit Orientation: -
Easting: m
R.L. Surface: NM

excavation dimensions: 2m long 0.6m wide
Northing: m
datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E	0.0			FILL: SILTY SAND Grey-brown, fine to coarse grained, some roots some lenses of charcoal and coal.	M			FILL
				E	0.5			FILL: CLAY Medium plasticity, orange-brown and grey. Trace of roots.				
								FILL: GRAVELLY CLAYEY SAND Grey and yellow-brown, fine to medium grained sand, medium grained gravel comprising charcoal and limestone fragments.				RESIDUAL
				E	1.0			SANDY SILT Cream. Sand is fine to coarse comprising quartz pebbles, trace of charcoal.				
								CLAY: Medium plasticity, orange-brown, trace of roots, trace of fine grained gravel comprising red-brown ironstone fragments.				
					1.5			Test pit TP7 terminated at 1.4m				
					2.0							
					2.5							
					3.0							
					3.5							
					4.0							

Sketch

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N Nil

penetration
1 2 3 4
no resistance ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear [kPa]
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on Unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Form GEO 5.2 Issue 3 Rev2 TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP8

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JNL

equipment type and model: BACKHOE Pit Orientation: - Easting: m R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide Northing: m datum:

excavation information							material substance					
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E	0.5			FILL: TOPSOIL Silt, grey, some roots.	M			FILL
								SILT: Cream with some dark-brown insect / root burrow mottles, some medium grained sand, trace of roots.				RESIDUAL
					1.0			Becoming yellow brown with orange-brown mottles at 0.6m				
				E				CLAY: Medium plasticity, pale orange-brown. Trace of roots.				
					1.5			Some dark red-brown medium to fine grained gravel comprising ironstone @ 1.0m				
								Test pit TP8 terminated at 1.5m				
					2.0							
					2.5							
					3.0							
					3.5							
					4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 6.2 Issue 3 Rev 2

method		support		notes, samples, tests		classification symbols and soil description based on unified classification system	consistency/density index	
N	natural exposure	S	shoring	U_{50}	undisturbed sample 50mm diameter		VS	very soft
X	existing excavation	N	nil	U_{63}	undisturbed sample 63mm diameter		S	soft
BH	backhoe bucket	penetration 1 2 3 4		D	disturbed sample		F	firm
B	bulldozer blade		no resistance ranging to refusal	V	vane shear (kPa)		St	stiff
R	ripper	water		Bs	bulk sample		VSt	very stiff
E	excavator		water level on date shown	E	environmental sample	moisture	H	hard
			water inflow	R	refusal	D dry	Fb	friable
			water outflow			M moist	VL	very loose
						W wet	L	loose
						Wp plastic limit	MD	medium dense
						W_L liquid limit	D	dense
							VD	very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP9

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JML

Coffey

equipment type and model: BACKHOE; Pit Orientation: -; Easting: m; R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide; Northing: m; datum:

excavation information						material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E E	0.5 1.0 1.5			FILL: TOPSOIL Silt, brown, trace of fine grained sand, some roots, one rusty anchor. SILT Cream, some dark red-brown mottles, one large nail becoming red-brown and more clay like with depth. CLAY: Medium plasticity, pale grey with orange mottles, trace of roots.	M			FILL RESIDUAL
					2.0 2.5 3.0 3.5 4.0			Test pit TP9 terminated at 1.75m				

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev 2

method		support		notes, samples, tests		classification symbols and soil description based on unified classification system	consistency/density index	
N	natural exposure	S	shoring	U_{50}	undisturbed sample 50mm diameter	moisture	VS	very soft
X	existing excavation	N	nil	U_{63}	undisturbed sample 63mm diameter	D dry	S	soft
BH	backhoe bucket	penetration 1 2 3 4		D	disturbed sample	M moist	F	firm
B	bulldozer blade		no resistance ranging to refusal	V	vane shear (kPa)	W wet	St	stiff
R	ripper	water		Bk	bulk sample	Wp plastic limit	VSt	very stiff
E	excavator		water level on date shown	E	environmental sample	W_L liquid limit	H	hard
			water inflow	R	refusal		Fb	friable
			water outflow				VL	very loose
							L	loose
							MD	medium dense
							D	dense
							VD	very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. **TP10**

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: **E12591/1**

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JMV

equipment type and model: BACKHOE — Pit Orientation: - — Easting: m — R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide — Northing: m — datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	depth (metres)	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
B/I		N	None Observed	E	0.0			FILL: TOPSOIL Silt, grey-brown, some roots, trace coarse gravel comprising limestone, trace of charcoal.	M			FILL
								SILT: Cream with brown insect / root infilled burrows, trace of roots.				RESIDUAL
				E	0.5			CLAY: Medium plasticity, orange-brown and grey, trace of red-brown mottles trace of roots, trace of medium gravel comprising siltstone.				
					1.0							
					1.5			Test pit TP10 terminated at 1.2m				
					2.0							
					2.5							
					3.0							
					3.5							
					4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev 2

method
N natural exposure
X existing excavation
B/I backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring
N nil

penetration
1 2 3 4
no resistance
ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 518

Excavation No. TP11

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JBC

equipment type and model: BACKHOE Pit Orientation: - Easting: m R.L. Surface: NM

excavation dimensions: 2m long 0.6m wide Northing: m datum:

excavation information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E		0.5			FILL: TOPSOIL Gravelly silt, brown. Fine grained gravel comprising charcoal and quartz, some roots. SILT Creek, some medium to coarse sand, abundant insect / root burrows, trace of roots, 1 worm.	M			FILL RESIDUAL
				E		1.0			CLAY: Medium plasticity, pale brown to orange with red-brown mottles. Some coarse to medium gravel comprising siltstone, trace of roots. Becoming grey-brown with red-brown mottles with depth.				
						1.5			Test pit TP11 terminated at 1.25m				
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration
1 2 3 4
no resistance ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GED 6.2 Issue 3 Rev.2

Coffey Geosciences Pty Ltd ACN 056 335 516

Engineering log - Excavation

Excavation No. TP12
Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Principal:
Project: *Environmental Site Assessment, Willawa Street, Portland*
Test pit location: *Refer to Figure 1*

Date started: *24.1.2002*
Date completed: *24.1.2002*
Logged by: *KME/JB*
Checked by: *JML*

equipment type and model: BACKHOE — Pit Orientation: - — Easting: m — R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide — Northing: m — datum:

excavation information						material substance					
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type; plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	G	0.0			FILL: TOPSOIL Silt, some roots, trace of coarse sand, some concrete.	M	MD		FILL
					0.5			SILT Cream, some medium to coarse gravel comising siltstone and limestone trace roots.				RESIDUAL
								CLAYEY SILTY GRAVEL: Pale brown, fine to coarse grained comprising siltstone, quartz and limestone.		F		
				E	1.0			CLAY: Grey with orange-brown and red-brown mottles. Trace of fine gravel comprising siltstone, trace of roots.				
					1.5			Test pit TP12 terminated at 1.3m				
					2.0							
					2.5							
					3.0							
					3.5							
					4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev 2

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration
1 2 3 4
no resistance ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP13

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JAL

Coffey

equipment type and model: BACKHOE | Pit Orientation: - | Easting: m | R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide | Northing: m | datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E		0.5			FILL:TOPSOIL Brown, some roots, trace charcoal and coarse sand.	M			FILL
									FILL: SILT Cream some grey mottles in insect/root burrows, trace roots, trace charcoal.				
									Becoming orange-brown with depth.				
				E		1.0			CLAY: Medium plasticity, grey with orange-brown and red-brown mottled, trace of medium gravel comprising limestone in siltstone fragments.				RESIDUAL
						1.5			Test pit TP13 terminated at 1.4m				
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev.2

method
N natural exposure
X existing excavation
Bkt backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration
1 2 3 4
no resistance
rougng to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP14

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JMV

equipment type and model: BACKHOE — Pit Orientation: - — Easting: m — R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide — Northing: m — datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E		0.5			FILL: TOPSOIL Silt, brown, some roots.	M			FILL
									FILL: SILT Cream with grey mottles, trace of roots, one plastic and metal water pipe.				
				E		1.0			GRAVELLY SILT: Orange-brown, gravel is medium to coarse and comprises siltstone, ironstone and limestone pebbles, some clay.				RESIDUAL
									Test pit TP14 terminated at 1.1m				
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 6.2 Issue 3 Rev 2

method
N natural exposure
X existing excavation
BH backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration
1 2 3 4
1 no resistance
2 ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Coffey Geosciences Pty Ltd ACN 056 335 516

Excavation No. TP15

Engineering log - Excavation

Sheet 1 of 1
Office Job No.: E12591/1

Client: *Barry F Cosier Solicitors*
Date started: *24.1.2002*

Principal:
Date completed: *24.1.2002*

Project: *Environmental Site Assessment, Willawa Street, Portland*
Logged by: *KME/JB*

Test pit location: *Refer to Figure 1*
Checked by: JHL

equipment type and model: BACKHOE Pit Orientation: - Easting: m R.L. Surface: NM
excavation dimensions: 2m long 0.6m wide Northing: m datum:

excavation information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
BH		N	None Observed	E		0.5			FILL: TOPSOIL Silt, grey-brown, some roots, trace fine sand, traces of glass.	M			FILL
				E		1.0			FILL: SILTY CLAY Cream-brown, low plasticity, traces of charcoal, trace of roots, trace of fine gravel comprising sandstone. Becoming orange-brown with depth. One metal 1m long 10cm wide pick.				
				E		1.5			CLAY Pale grey with red-brown and white mottles, medium plasticity, some coarse gravel comprising limestone.				RESIDUAL
				E		2.0			Test pit TP15 terminated at 1.7m				
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

TESTPIT E12591.GPJ COFFEY.GDT 04.02.02

Form GEO 5.2 Issue 3 Rev 2

method
N natural exposure
X existing excavation
Bkt backhoe bucket
B bulldozer blade
R ripper
E excavator

support
S shoring N nil

penetration
1 2 3 4 no resistance ranging to refusal

water
water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on Unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

APPENDIX C

PID RESULTS

Coffey

form E5.1 - photoionisation detector results

sheet 1 of 3

client: Barry F Cosser Solicitors
office: SWANSEA
principal:
date: 24 JAN 2002
project: ESA
by: KMC
location: FORMER G.P. SURGERY, MILFORD
checked by:
PID serial number:
lamp voltage:
last checked/calibrated: 23 JAN 2002
calibration gas type/concentration: IC4

location number	test type*	bore or sample probe depth (m)	duration (mins)	background reading (ppm)	test reading (ppm)	maximum reading (ppm)	notes
TP1	H.S	0.8 -1.2	3	0.1	8.0	16.0	
TP#2		0.1-0.35			13.4	25.8	
TP2		0.4 -0.65			16.2	21.1	
TP2		1.0 -1.3			8.3	26.2	
TP3		0.25 -0.45			15.1	19.8	
TP3		1.0 -1.2			13.2	23.9	
TP4		0.1-0.3			16.4	23.3	
TP4		0.8 -1.0			10.0	17.6	
TP6		1.0 -1.3			9.6	22.9	
TP5		1.25-1.55			8.4	11.9	
TP6		0.25 -0.45			16.7	25.7	
TP6		0.8 -1.1			17.5	22.8	
TP7		0.35 -0.55			22.1	32.0	
TP7		1.0 -1.3			13.5	27.7	
TP8		0.1-0.3			11.2	15.4	
TP8		1.0-1.3			13.5	49.2	
TP9		0.2 -0.4			19.0	29.0	
TP9		1.0 -1.2			17.4	24.2	
TP10		0.1 -0.3			19.9	28.9	
TP10		0.8 -1.0			14.4	30.1	
TP7		0.0 -0.21			18.2	26.3	
TP11		0.1-0.3			3.1	6.9	
TP4	↓	0.8 -1.2	↓	↓	23.5	28.4	

*Fill in the test type as follows:- BH ( ) = soil gas probe sample; (soil type - unified classification system in parentheses)
HS ( ) = headspace sample (with soil type-unified classification system in parentheses)

form E5.1 - photoionisation detector results

client: Barry F Cosier Solicitors
office: [illegible]
principal:
date: 24 JAN 2002
project: ESA
by: K.F
location: PORTION 52, WINCHCOMBE STREET, LITHGOW
checked by:
PID serial number: MINIRAE 2000
lamp voltage:
last checked/calibrated: 23 JAN 2002
calibration gas type/concentration: /04

location number	test type*	bore or sample probe depth (m)	duration (mins)	background reading (ppm)	last reading (ppm)	maximum reading (ppm)	notes
TP12	H.S	0.0 - 0.15	3	0.1	13.1	19.8	
TP12		1.0 - 1.3			8.3	26.0	
TP13		0.1 - 0.3			9.6	17.3	
TP13		1.0 - 1.3			11.8	18.7	
TP14		0.0 - 0.2			8.0	10.9	
TP14		0.8 - 1.0			23.3	29.3	
TP15		0.1 - 0.3			20.4	25.4	
TP15		1.0 - 1.2			9.8	18.2	
TP15		1.5 - 1.7			14.0	19.5	
BH1		0.0 - 0.3			10.4	14.4	
BH2		0.0 - 0.3			10.7	14.6	
BH3		0.0 - 0.3			6.5	14.2	
BH4		0.0 - 0.3			12.5	17.6	
BH5		0.0 - 0.3			9.1	12.0	
BH5		0.5 - 0.6			13.5	17.3	
BH6		0.0 - 0.3			5.8	19.0	
BH6		0.5 - 0.8			4.9	15.6	
BH 7		0.0 - 0.3			17.5	20.4	
BH 7		0.5 - 0.75			15.1	23.7	
BH 8		0.0 - 0.3			9.5	15.0	
BH8		0.5 - 0.65			8.2	16.0	
BH9		0.0 - 0.3			18.6	20.8	
BH9	↓	0.5 - 0.7	↓	↓	16.9	28.2	

*Fill in the test type as follows:- BH ( ) = soil gas probe sample; (soil type - unified classification system in parentheses)
HS ( ) = headspace sample (with soil type-unified classification system in parentheses)

fprm E5.1 - photoionisation detector results

client: Barry F Cosier Solicitors

office: SHANCM

principal

date: 24 JAN 2002

project: ESA

by: KAC

location: STATION SQ. LONGBRIDGE STREET, UTTOXETER

checked by:

PID serial number:

lamp voltage:

last checked/calibrated: 23 JAN 2002

calibration gas type/concentration: IC4

location number	test type*	bore or sample probe depth (m)	duration (mins)	background reading (ppm)	test reading (ppm)	maximum reading (ppm)	notes
BH10	H.S	0.0-0.3	3	0.1	10.0	11.3	
BH11	H.S	0.0-0.3	3	0.1	12.2	23.5	

*Fill in the test type as follows:- BH ( ) = soil gas probe sample; (soil type - unified classification system in parentheses)
HS ( ) = headspace sample (with soil type-unified classification system in parentheses)

APPENDIX D

LABORATORY ANALYTICAL REPORTS AND CHAIN OF CUSTODY FORMS

Coffey

Coffey Geosciences Pty Ltd ACN 056 335 516

Geotechnical | **Resources** | Environmental | **Technical** | Project Management

142 Wicks Road North Ryde
NSW 2113 Australia
PO Box 125 North Ryde
NSW 1670 Australia
Telephone +61 2 9888 7444
Facsimile +61 2 9888 9977
Email sydney@coffey.com.au

Coffey

Facsimile Transmission

To	ALS Environmental	From	Kylie Eckersley
Attention	MICHAEL HEERY	Date	25 January, 2002
Facsimile number	8784 8500	Our Reference	E12591/1AD
cc		Number of pages including this page	2
Subject:	NEW IDENTIFICATION NAMES FOR SAMPLES		

Dear Michael,

As discussed, we require those soil samples submitted to you under job E12591/1 renamed. Please amend the sample names according to the following table.

NEW IDENTIFICATION NAMES FOR SOIL SAMPLES

Original Name	To be Changed to
TP1	TP1 (unchanged)
TP4	TP2
TP6	TP3
TP8	TP4
TP10	TP5
TP12	TP6
TP14	TP7
TP15	TP8
TP16	TP9
TP17	TP10
TP18	TP11
TP19	TP12
TP21	TP13

Original Name	To be Changed to
TP22	TP14
TP23	TP15
BH7	BH1
BH8	BH2
BH9	BH3
BH10	BH4
BH11	BH5
BH12	BH6
BH13	BH7
BH14	BH8
BH15	BH9
BH16	BH10
BH17	BH11

If you have any questions regarding the above please call me on 9888 7444.

Cheers,

Kylie

Chain of Custody

Coffey

No: 29933

Laboratory Quotation / Order No: 50703 | Job No: E12591/1 | Sheet 1 of 4

Dispatch to: ALS ENVIRONMENTAL (Address & Phone No.) 277-289 WOODPARK RD, SMITHFIELD, NSW 2164 Ph 8784 8555	Sampled by: KNE/JB	Consigning Office: SYDNEY Date Dispatched: 25 JAN 2002
Attention: MICHAEL HEERY	Project Manager: (report results to) JOSH LASKY	Courier Service: Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	25/1/02	12pm	[signature]	25/1/02	12:05
			Kerry Stefanovic		
CONTRACT WORK			ALS Syd	25/1/2	2:25pm

BACTO ASET

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals	Asbestos	HOLD	Sample Condition on Receipt
	Soil	GLASS JAR / ICE	(H) TP1 0.8-1.2	24/1/02							
	↓	↓	(H) TP1 0.1-0.4	↓				X			
			(1) TP2/TP1 0.1-0.35		✓	✓	✓	✓			
			(2) TP2 0.4-0.65					✓			
			(H) TP2 1.0-1.3								
			(3) TP3 0.25-0.45		✓			✓			
			(H) TP3 0.25-0.45A								
			(H) TP3 1.0-1.2								
			(4) TP4 0.1-0.3		✓	✓	✓	✓			
			(5) TP4 0.1-0.3A		✓	✓	✓	✓			
			(H) TP4 0.8-1.0								
			(6) TP5 0.35-0.55		✓			✓			
			(H) TP5 1.0-1.3								
			(H) TP5 1.0-1.3A								
			(7) TP6 0.25-0.45		✓	✓	✓	✓	✓		
			(H) TP6 0.8-1.2								
			(H) TP6 0.8-1.2A								

0-metals (S)
1-metals (W)
2-TIB-(S)
3-PAH-(S)

Batch No: ES31740 ☑ ORG
Batched date: 27-1-2
☑ Soil ☐ Ambient
☐ Water ☑ Chilled
☐ Other ___ °C
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Actioned
32 x Soil Jar
1 x 1L Amber
1 x 250 mls HNO3
2 x Vial HCl

Special Laboratory Instructions: H.M = STANDARD 8

Detection Limits:

Turnaround Required: AS DISCUSSED WITH M. HEERY WED 30TH JAN 2002 (AT THE LATEST)

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

No: 29934

Chain of Custody

Laboratory Quotation / Order No: 50703 | Job No: E12591/1 | Sheet 2 of 4

Coffey

Dispatch to: ALS ENVIRONMENTAL (Address & Phone No.) 277-289 WOODPARK RD SMITHFIELD, NSW 2164 PH 9756 9555	Sampled by: KME/JB	Consigning Office: SYDNEY Date Dispatched: 25/1/02
Attention: MICHAEL HEERY	Project Manager: (report results to) JOSH LASLY	Courier Service: Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	25/1/02	12-		25/1/02	12.05
			Ly Kemystefanovic ALS Syd	25-1-02	2.25pm

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	Analyses Required: PAHs	TPHs	MAHs + BTEX	Metals	Asbestos		Hold	Sample Condition on Receipt
CC	SOIL	GLASS JAR/ICE (12)	TP1 0.0-0.2	24/1/02	✓			✓				
ASBT		(H)	TP1 0.0-0.2(A									
		(9)	TP2 0.35-0.55					✓				
		(H)	TP2 1.0-1.3									
		(10)	TP3 0.1-0.3			HWT		✓	✓			
		(11)	TP3 01-0.3A					✓	✓			
		(H)	TP3 1.0-1.3									
		(12)	TP4 0.2-0.4					✓				
		(13)	TP4 1.0-1.2					✓				
		(14)	TP10 0.1-0.3		✓	✓	✓	✓	✓			
		(15)	TP10 0.1-0.3A					✓	✓			
		(H)	TP10 0.5-1.0									
		(16)	TP11 0.1-0.3		✓	HWT		✓	✓			
		(H)	TP11 0.8-1.2									
		(17)	TP12 0.0-0.15					✓	✓			
		(H)	TP12 1.0-1.3									
		(18)	TP13 0.1-0.3		✓	✓	✓	✓				

Batch No: ES31710 ORG
Batched Date: 27-1-2
☑ Soil ☐ Ambient
☑ Water ☐ Chilled
☐ Other ice
☐ Subcontract Work
☐ Bottle Return
☐ Inst. Anal. Actioned

32X Soil Jar
1 X 1L Amber
2 X Vial HCl
1 X 250mL HNO3

Special Laboratory Instructions: H.M. STANDARD 8

Detection Limits:

Turnaround Required: AS AGREED WITH M. HEERY 31ST JAN 2002 (BY THE LATEST) WEDNESDAY

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

(H)

No: 29935

Chain of Custody

Laboratory Quotation / Order No: S0703

Job No: E12591/1

Sheet 3 of 4

Coffey

Dispatch to: ALS ENVIRONMENTAL (Address & Phone No.) 277 - 289 WOODPARK RD, SMITHFIELD, NSW 2164 PH 8784 8555	Sampled by: KME/JB	Consigning Office: SYDNEY Date Dispatched: 25/1/02
Attention: MICHAEL HEENY	Project Manager: (report results to) JOSH LAGUY 17:05	Courier Service: Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	25/1/02	12-	[signature]	25/1/02	17:05
[signature]			Kerry Stefanovic ALS Syd	25/1/2	2.25pm

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals	Asbestos	HOLD	Sample Condition on Receipt
	SOIL	GLASS JAR/ICE (H)	TP13 1.0-1.3	24/1/02							
		(19)	TP14 0.0-0.2					✓	✓		
		(20)	TP14 0.8-1.0					✓			
		(21)	TP15 0.1-0.3		✓			✓	✓		
		(H)	TP15 1.0-1.2								
		(H)	TP15 1.5-1.7								
		(22)	BH1 0.0-0.3					✓	✓		
		(23)	BH2 0.0-0.3					✓			
		(24)	BH3 0.0-0.3					✓	✓		
		(25)	BH4 0.0-0.3					✓			
		(26)	BH5 0.0-0.3					✓	[illegible]		
		(H)	BH5 0.5-0.6								
		(27)	BH6 0.0-0.3					✓	✓		
		(H)	BH6 0.5-0.8								
		(28)	BH7 0.0-0.3					✓	✓		
		(H)	BH7 0.5-0.75								
		(29)	BH8 0.0-0.3					✓	✓		

Batch No.: ES31740 ☑ ORG
Batched date: 27.1.2
☑ Soil ☐ Ambient
☑ Water ☑ Chilled °C
☐ Other
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Actioned
32 x Soil Jar
1 x 1L Amber
1 x 250 mls HNO3
2 x Vial HCl

Special Laboratory Instructions: H.M = STANDARD 8

Turnaround Required: As DISCUSSED WITH M. HEENY ... 2002 (BY THE SAMPLER)

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

No: 29936

Coffey

Chain of Custody

Laboratory Quotation / Order No: S0703

Job No: E12591/1

Sheet 4 of 4

Dispatch to (Address & Phone No.): ALS ENVIRONMENTAL 277-289 WOODPARK RD. SMITHFIELD, NSW 2164 PH 9785 8555

Sampled by: MGH/JB

Consigning Office: SYDNEY

Date Dispatched: 25/1/02

Attention: MICHAEL HEERY

Project Manager (report results to): JOSH CASKEY

Courier Service:

Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	25/1/02	12-	[signature]	25/1/02	12:05
			Kerry Stefanovic ALS	25/1/2	2.25pm

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs + BTEX	Metals	Asbestos		HOLD	Sample Condition on Receipt
	SOIL	GLASS JAR/ICE (41)	BH8 0.5-0.65	24/1/02								
	↓	↓ (30)	BH9 0.0-0.3	↓				✓	✓			
	↓	↓ (H)	BH9 0.5-0.7	↓								
	↓	↓ (31)	BH10 0.0-0.3	↓				✓	✓			
	↓	↓ (32)	BH11 0.0-0.3	↓				✓	✓			
	WATER	BOTTLE/ICE (33)	WB-25-1-02	↓				✓				

CONTRACT WORK

~~ENCH~~ ASET

Batch No.: ES2174D ☐ ORG
Batched date: 27.1.2
☑ Soil ☐ Ambient
☐ Water ☐ Chilled
☐ Other °C
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Actioned

32 x Soil jar
1 x 1L Amber
2 x vial HCl
1 x 250mls HNO3

Special Laboratory Instructions: ASM- STANDARD S

Detection Limits:

Turnaround Required: AS DISCUSSED WITH M. HEERY. 30th JAN 2002 (AT THE LATEST)

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results

SAMPLE RECEIPT ADVICE

COMPANY: COFFEY GEOSCIENCES PTY LTD
ATTENTION: MR JOSHUA LASKY
DATE: Jan. 29, 2002
FROM: Karin White, ENV SYDNEY

ALS has received samples pertaining to your reference: S0703

For future reference the batch number on this order is: ES31740

All samples and paper work were received in good order.
Samples have been received within recommended holding times.
Samples chilled when received.
Sample containers do not comply to pretreatment/preservation standards (AS,APHA,USEPA)
Please direct any turnaround/technical queries to Michael Heery.
Any queries relating to sample condition/numbering/breakages should be directed to Wael Saleh.
ANALYTICAL WORK FOR THIS BATCH WILL BE CONDUCTED AT ALS SYDNEY
All aqueous samples are stored for two weeks and solid samples for three months from the date of completion of the batch, unless specific arrangements are made otherwise.

Purchase Order Number: S0703
Chain of Custody Reference Number: 29933
Project Name: E12591/1

You can expect results to be reported as detailed below:

All Environmental Results Jan. 30, 2002

Comments: HNO3 field filtered preserved samples should be supplied for dissolved metal analysis.

A L S - SERVICING YOUR NEEDS BETTER

ASET AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD
ACN 088 095 112

Our ref : ASET1472 / 1687 / 1-17.
Your ref :ES31740
NATA Accreditation No: 14484

29 January 2002

Australian Laboratory Services Pty Ltd,
277,Woodpark Road
Smithfield,
NSW 2164.

Fax No:02-87848500
Attn:Mr Michael Heery

Dear Michael,
This report presents the results of seventeen samples, forwarded by Australian Laboratory Services Pty Ltd, on 29 January 2002, for analysis for asbestos.

1. Introduction: Seventeen samples forwarded were examined and analysed for the presence of asbestos.

2. Methods: The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy inconjunction with dispersion Staining method. (Safer Environment Method 1.)

3. Results:

Sample No. 1. ASET1472 / 1687 / 1. ES31740 - TP6 (0.25 - 0.45).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, stones, sand and debris.
No asbestos detected.

Sample No. 2. ASET1472 / 1687 / 2. #10 - ES31740 - TP8 (0.10 - 0.30).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, fragments of plaster, stones and debris.
No asbestos detected.

Sample No. 3. ASET1472 / 1687 / 3. #11 - ES31740 - TP8 (0.10 - 0.3A).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of plaster, sand and debris.
No asbestos detected.

Sample No. 4. ASET1472 / 1687 / 4. #14 - ES31740 - TP10 (0.10 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of plaster, sand and debris.
No asbestos detected.

Sample No. 5. ASET1472 / 1687 / 5. #15 - ES31740 - TP10 (0.10 - 0.3A).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of plaster, sand and debris.
No asbestos detected.

Sample No. 6. ASET1472 / 1687 / 6. #16 - ES31740 - TP11 (0.10 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, plaster, sand , stones and debris.
No asbestos detected.

Sample No. 7. ASET1472 / 1687 / 7. #17 - ES31740 - TP12 (0.0 - 0.15).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, stones, sand, fragments of plaster and paint flakes, plant matter and debris.
No asbestos detected.

Sample No. 8. ASET1472 / 1687 / 8. #19 - ES31740 - TP14 (0.0 - 0.2).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, stones, sand, fragments of plaster, plant matter and debris.
No asbestos detected.

Sample No. 9. ASET1472 / 1687 / 9. #21 - ES31740 - TP15 (0.1 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, sand, plant matter, stones and debris.
No asbestos detected.

Sample No. 10. ASET1472 / 1687 / 10. #24 - ES31740 - BH3 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, sand, stones, plant matter and debris.
No asbestos detected.

Sample No. 11. ASET1472 / 1687 / 11. #27 - ES31740 - BH6 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, stones, sand and debris.
No asbestos detected.

Sample No. 12. ASET1472 / 1687 / 12. #28 - ES31740 - BH7 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, stones, sand and debris.
No asbestos detected.

Sample No. 13. ASET1472 / 1687 / 13. #29 - ES31740 - BH8 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, sand, stones, plant matter and debris.
No asbestos detected.

Sample No. 14. ASET1472 / 1687 / 14. #30 - ES31740 - BH9 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, sand, stones, plant matter and debris.
No asbestos detected.

Sample No. 15. ASET1472 / 1687 / 15. #31 - ES31740 - BH10 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, sand, stones and debris.
No asbestos detected.

Sample No. 16. ASET1472 / 1687 / 16. #32 - ES31740 - BH11 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, sand, stones, plant matter and debris.
No asbestos detected.

Sample No. 17. ASET1472 / 1687 / 17. #22 - ES31740 - BH1 (0.0 - 0.3).
Approx dimensions 3.5 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, stones, sand, plant matter and debris.
No asbestos detected.

NATA Accredited Laboratory
Number: 14484.

NATA endorsed test report. This document shall not be reproduced, except in full.

Analysed and reported by,

Mahen De Silva . MSc. Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Signatory.

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MR JOSHUA LASKY	BATCH:	ES31740
CLIENT:	COFFEY GEOSCIENCES PTY LTD	SUB BATCH:	0
ADDRESS:		LABORATORY:	SYDNEY
	P O BOX 125	DATE RECEIVED:	25/01/2002
	NORTH RYDE NSW 2113	DATE COMPLETED:	31/01/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	S0703	No. of SAMPLES:	32
PROJECT:	E12591/1		

COMMENTS

Samples as received digested by USEPA method 200.2 (mod) prior to the determination of metals. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999). This report supersedes any previous preliminary reports of the same batch number.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: brianw@als.com.au

Signatory Greg Vogel

LABORATORIES

AUSTRALASIA		*AMERICAS*
Brisbane	*Hong Kong*	*Vancouver*
Melbourne	*Singapore*	*Santiago*
Sydney	*Kuala Lumpur*	*Antofagasta*
Newcastle	*Bogor*	*Lima*
Auckland		

NATA No. 10918

Batch: ES31740
Sub Batch: 0
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	2	3	4	5	6	7	8	9	10
		Date Sampled		24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP2_ 0.1-0.35	TP2_ 0.4-0.65	TP3_ 0.25-0.45	TP4_ 0.1-0.3	TP4_ 0.1-0.3A	TP5_ 0.25-0.55	TP6_ 0.25-0.45	TP7_ 0.0-0.21	TP7_ 0.35-0.55	TP8_ 0.1-0.3
EA-055	Moisture Content (dried @ 103°C)	%	0.1	16.7	4.3	4.3	18.6	18.9	3.2	6.2	12.6	10.4	5.6
EG-005T	Arsenic - Total	mg/kg	1	8	6	4	3	4	2	2	4	6	5
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG-005T	Chromium - Total	mg/kg	1	21	42	16	17	16	11	18	12	24	18
EG-005T	Copper - Total	mg/kg	1	44	3	3	43	44	3	6	87	19	5
EG-005T	Nickel - Total	mg/kg	1	8	1	<1	24	22	<1	1	6	6	1
EG-005T	Lead - Total	mg/kg	1	335	21	14	178	194	10	9	253	100	17
EG-005T	Zinc - Total	mg/kg	1	358	6	8	220	308	9	9	372	165	11
EG-035T	Mercury - Total	mg/kg	0.1	0.1	<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.1	0.1	<0.1

Batch: ES31740
Sub Batch: 0
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		11	12	13	14	15	16	17	18	19	20
		Date Sampled		24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP8_ 0.1-0.3A	TP9_ 0.2-0.4	TP9_ 1.0-1.2	TP10_ 0.1-0.3	TP10_ 0.1-0.3A	TP11_ 0.1-0.3	TP12_ 0.0-0.15	TP13_ 0.1-0.3	TP14_ 0.0-0.2	TP14_ 0.8-1.0
EA-055	Moisture Content (dried @ 103°C)	%	0.1	5.4	11.9	12.7	4.6	4.3	5.1	8.6	10.6	9.2	7.2
EG-005T	Arsenic - Total	mg/kg	1	4	5	3	3	<1	4	3	3	3	5
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG-005T	Chromium - Total	mg/kg	1	22	20	25	9	5	18	11	12	7	20
EG-005T	Copper - Total	mg/kg	1	6	8	6	1	1	2	10	6	13	5
EG-005T	Nickel - Total	mg/kg	1	1	4	3	<1	<1	<1	3	1	4	2
EG-005T	Lead - Total	mg/kg	1	13	11	13	8	4	9	44	7	57	11
EG-005T	Zinc - Total	mg/kg	1	11	10	15	4	3	5	137	10	70	13
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Batch: ES31740
Sub Batch: 0
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		21	22	23	24	25	26	27	28	29	30
		Date Sampled		24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP15_ 0.1-0.3	BH1_ 0.0-0.3	BH2_ 0.0-0.3	BH3_ 0.0-0.3	BH4_ 0.0-0.3	BH5_ 0.0-0.3	BH6_ 0.0-0.3	BH7_ 0.0-0.3	BH8_ 0.0-0.3	BH9_ 0.0-0.3
EA-055	Moisture Content (dried @ 103°C)	%	0.1	18.8	22.1	10.5	9.3	17.5	11.3	19.2	16.5	8.4	7.4
EG-005T	Arsenic - Total	mg/kg	1	4	7	5	3	4	6	5	4	30	3
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG-005T	Chromium - Total	mg/kg	1	13	13	11	13	13	16	14	7	8	11
EG-005T	Copper - Total	mg/kg	1	20	46	219	14	20	46	35	13	16	8
EG-005T	Nickel - Total	mg/kg	1	5	7	8	4	9	9	9	3	6	2
EG-005T	Lead - Total	mg/kg	1	272	336	435	213	320	327	671	196	227	133
EG-005T	Zinc - Total	mg/kg	1	100	296	228	78	104	264	211	146	152	75
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	0.5	0.2	0.2	0.1	0.2	0.4	0.2	0.2	<0.1

Batch: ES31740
Sub Batch: 0
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION							
		Laboratory I.D.		31	32						
		Date Sampled		24/01/2002	24/01/2002						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH10_ 0.0-0.3	BH11_ 0.0-0.3						
EA-055	Moisture Content (dried @ 103°C)	%	0.1	5.4	5.2						
EG-005T	Arsenic - Total	mg/kg	1	3	5						
EG-005T	Cadmium - Total	mg/kg	1	<1	<1						
EG-005T	Chromium - Total	mg/kg	1	9	18						
EG-005T	Copper - Total	mg/kg	1	8	11						
EG-005T	Nickel - Total	mg/kg	1	2	2						
EG-005T	Lead - Total	mg/kg	1	79	112						
EG-005T	Zinc - Total	mg/kg	1	45	82						
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	<0.1						

Batch: ES31740
Sub Batch: 0
Date of issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	1	11	11	21	21	31	31	200	201
		Date Sampled		24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	25/01/2002	25/01/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP2_0.1-0.35_MS	TP2_0.1-0.35_CHK	TP8_0.1-0.3A_MS	TP8_0.1-0.3A_CHK	TP15_0.1-0.3_MS	TP15_0.1-0.3_CHK	BH10_0.0-0.3_MS	BH10_0.0-0.3_CHK	METHOD BLANK1	LCS1
				CHECKS AND SPIKES									
EA-055	Moisture Content (dried @ 103°C)	%	0.1	---	16.7	---	5.4	---	18.8	---	5.4	---	---
EG-005T	Arsenic - Total	mg/kg	1	100%	8	93.0%	5	110%	3	101%	4	<1	94.0%
EG-005T	Cadmium - Total	mg/kg	1	99.0%	<1	95.0%	<1	101%	<1	102%	<1	<1	96.0%
EG-005T	Chromium - Total	mg/kg	1	97.0%	22	89.0%	19	101%	12	102%	12	<1	92.0%
EG-005T	Copper - Total	mg/kg	1	97.0%	38	95.0%	5	107%	19	105%	7	<1	97.0%
EG-005T	Nickel - Total	mg/kg	1	98.0%	6	96.0%	1	105%	5	100%	1	<1	98.0%
EG-005T	Lead - Total	mg/kg	1	---	316	97.0%	12	---	256	103%	72	<1	98.0%
EG-005T	Zinc - Total	mg/kg	1	---	275	98.0%	10	92.0%	99	105%	38	<1	97.0%
EG-035T	Mercury - Total	mg/kg	0.1	92.0%	0.1	94.0%	<0.1	94.0%	<0.1	93.0%	<0.1	<0.1	91.0%

Batch: ES31740
Sub Batch: 0
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION							
		Laboratory I.D.		205	206						
		Date Sampled		25/01/2002	25/01/2002						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK2	LCS2						
				CHECKS AND SPIKES							
EA-055	Moisture Content (dried @ 103°C)	%	0.1	----	----						
EG-005T	Arsenic - Total	mg/kg	1	<1	96.0%						
EG-005T	Cadmium - Total	mg/kg	1	<1	94.0%						
EG-005T	Chromium - Total	mg/kg	1	<1	91.0%						
EG-005T	Copper - Total	mg/kg	1	<1	97.0%						
EG-005T	Nickel - Total	mg/kg	1	<1	96.0%						
EG-005T	Lead - Total	mg/kg	1	<1	98.0%						
EG-005T	Zinc - Total	mg/kg	1	<1	95.0%						
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	93.0%						

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MR JOSHUA LASKY	**BATCH:**	ES31740
CLIENT:	COFFEY GEOSCIENCES PTY LTD	**SUB BATCH:**	1
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 125 NORTH RYDE NSW 2113	**DATE RECEIVED:**	25/01/2002
		DATE COMPLETED:	31/01/2002
		SAMPLE TYPE:	WATER
ORDER No.:	S0703	**No. of SAMPLES:**	1
PROJECT:	E12591/1		

COMMENTS

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

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Signatory Greg Vogel

Batch: ES31740
Sub Batch: 1
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION
		Laboratory I.D.		33
		Date Sampled		24/01/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	WB-25-1-02
EG-020F	Arsenic - Filtered	ug/L	1	<1
EG-020F	Cadmium - Filtered	ug/L	1	<1
EG-020F	Chromium - Filtered	ug/L	1	<1
EG-020F	Copper - Filtered	ug/L	1	<1
EG-020F	Nickel - Filtered	ug/L	1	<1
EG-020F	Lead - Filtered	ug/L	1	<1
EG-020F	Zinc - Filtered	ug/L	1	2
EG-035F	Mercury - Filtered	ug/L	0.1	<0.1

Batch: ES31740
Sub Batch: 1
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION								
		Laboratory I.D.		200	201	202						
		Date Sampled		25/01/2002	25/01/2002	25/01/2002						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	LCS	MS						
				CHECKS AND SPIKES								
EG-020F	Arsenic - Filtered	ug/L	1	<1	89.0%	106%						
EG-020F	Cadmium - Filtered	ug/L	1	<1	93.0%	102%						
EG-020F	Chromium - Filtered	ug/L	1	<1	88.0%	93.0%						
EG-020F	Copper - Filtered	ug/L	1	<1	89.0%	99.0%						
EG-020F	Nickel - Filtered	ug/L	1	<1	88.0%	100%						
EG-020F	Lead - Filtered	ug/L	1	<1	94.0%	100%						
EG-020F	Zinc - Filtered	ug/L	1	<1	91.0%	104%						
EG-035F	Mercury - Filtered	ug/L	0.1	<0.1	95.0%	98.0%						

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MR JOSHUA LASKY	**BATCH:**	ES31740
CLIENT:	COFFEY GEOSCIENCES PTY LTD	**SUB BATCH:**	2
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 125	**DATE RECEIVED:**	25/01/2002
	NORTH RYDE NSW 2113	**DATE COMPLETED:**	31/01/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	S0703	**No. of SAMPLES:**	6
PROJECT:	E12591/1		

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999).

NOTES

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ISSUING LABORATORY: SYDNEY

Address
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Signatory

Batch:	ES31740
Sub Batch:	2
Date of Issue:	31/01/2002
Client:	COFFEY GEOSCIENCES PTY LTD
Client Reference:	E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION								
		Laboratory I.D.		1	4	5	7	14	18			
		Date Sampled		24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002			
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP2_ 0.1-0.35	TP4_ 0.1-0.3	TP4_ 0.1-0.3A	TP6_ 0.25-0.45	TP10_ 0.1-0.3	TP13_ 0.1-0.3			
EA-055	Moisture Content (dried @ 103°C)	%	0.1	15.7	16.6	18.9	6.2	4.6	10.6			
EP-071-SS	**TOTAL PETROLEUM HYDROCARBONS**											
EP-071-SS	C6 - C9 Fraction	mg/kg	2	<2	<2	<2	<2	<2	<2			
EP-071-SS	C10 - C14 Fraction	mg/kg	50	<50	<50	<50	<50	<50	<50			
EP-071-SS	C15 - C28 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100			
EP-071-SS	C29 - C36 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100			
EP-080-SS	**BTEX**											
EP-080-SS	Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
EP-080-SS	Toluene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
EP-080-SS	Chlorobenzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
EP-080-SS	Ethylbenzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
EP-080-SS	meta- & para-Xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
EP-080-SS	ortho-Xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
EP-080S-SS	**VOLATILE TPH/BTEX COMPOUND SURROGATES**											
EP-080S-SS	1,2-Dichloroethane-D4	%	1	89	87	91	100	102	103			
EP-080S-SS	Toluene-D8	%	1	95	89	92	103	101	102			
EP-080S-SS	4-Bromofluorobenzene	%	1	98	89	91	107	105	106			

Batch: ES31740
Sub Batch: 2
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION				
		Laboratory I.D.		100	101	102	103	104
		Date Sampled		25/01/2002	25/01/2002	25/01/2002	25/01/2002	25/01/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK1	NTPHT3083 SCS	NTPHT3083 DCS	NTPHT3083 MS	NTPHT3083 MSD
				CHECKS AND SPIKES				
EA-055	Moisture Content (dried @ 103°C)	%	0.1	---	---	---	---	---
EP-071-SS	**TOTAL PETROLEUM HYDROCARBONS**							
EP-071-SS	C6 - C9 Fraction	mg/kg	2	<2	102%	102%	89.0%	89.0%
EP-071-SS	C10 - C14 Fraction	mg/kg	50	<50	95.0%	95.0%	92.0%	88.0%
EP-071-SS	C15 - C28 Fraction	mg/kg	100	<100	100%	100%	96.0%	88.0%
EP-071-SS	C29 - C36 Fraction	mg/kg	100	<100	102%	103%	---	---
EP-080-SS	**BTEX**							
EP-080-SS	Benzene	mg/kg	0.2	<0.2	97.0%	101%	102%	108%
EP-080-SS	Toluene	mg/kg	0.2	<0.2	96.0%	101%	86.0%	89.0%
EP-080-SS	Chlorobenzene	mg/kg	0.2	<0.2	98.0%	102%	97.0%	101%
EP-080-SS	Ethylbenzene	mg/kg	0.2	<0.2	101%	102%	---	---
EP-080-SS	meta- & para-Xylene	mg/kg	0.2	<0.2	100%	100%	---	---
EP-080-SS	ortho-Xylene	mg/kg	0.2	<0.2	100%	101%	---	---
EP-080S-SS	**VOLATILE TPH/BTEX COMPOUND SURROGATES**							
EP-080S-SS	1,2-Dichloroethane-D4	%	1	110	103	105	97	101
EP-080S-SS	Toluene-D8	%	1	106	110	104	99	101
EP-080S-SS	4-Bromofluorobenzene	%	1	107	109	103	98	101

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MR JOSHUA LASKY	**BATCH:**	ES31740
CLIENT:	COFFEY GEOSCIENCES PTY LTD	**SUB BATCH:**	3
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 125 NORTH RYDE NSW 2113	**DATE RECEIVED:**	25/01/2002
		DATE COMPLETED:	31/01/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	S0703	**No. of SAMPLES:**	11
PROJECT:	E12591/1		

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Polentially Contaminated Soil (December 1999).

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
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Email: brianw@als.com.au

Signatory

Batch: ES31740
Sub Batch: 3
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	3	4	5	6	7	8	14	16	18
		Date Sampled		24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002	24/01/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP2_ 0.1-0.35	TP3_ 0.25-0.45	TP4_ 0.1-0.3	TP4_ 0.1-0.3A	TP5_ 0.25-0.55	TP5_ 0.25-0.45	TP7_ 0.0-0.21	TP10_ 0.1-0.3	TP11_ 0.1-0.3	TP13_ 0.1-0.3
EA-055	Moisture Content (dried @ 103°C)	%	0.1	16.7	4.3	18.6	18.9	3.2	5.2	12.6	4.6	5.1	13.6
EP-076A-SS	**POLYNUCLEAR AROMATIC HYDROCARBONS**												
EP-076A-SS	Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Fluorene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5
EP-076A-SS	Anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5
EP-076A-SS	Pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Chrysene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Indeno(1.2.3.cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Dibenz(a.h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076A-SS	Benzo(g.h.i)perylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EP-076S-SS	**SURROGATE COMPOUNDS**												
EP-076S-SS	2-Fluorobiphenyl	%	1	80	86	76	73	79	81	81	81	76	88
EP-076S-SS	Anthracene-d10	%	1	104	112	91	89	104	102	71	109	97	104
EP-076S-SS	p-Terphenyl-d14	%	1	97	93	86	75	100	106	72	102	82	106

Batch: ES31740
Sub Batch: 3
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION							
		Laboratory I.D.		21							
		Date Sampled		24/01/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP15_ 0.1-0.3							
EA-055	Moisture Content (dried @ 103°C)	%	0.1	18.8							
EP-076A-SS	POLYNUCLEAR AROMATIC HYDROCARBONS										
EP-076A-SS	Naphthalene	mg/kg	0.5	<0.5							
EP-076A-SS	Acenaphthylene	mg/kg	0.5	<0.5							
EP-076A-SS	Acenaphthene	mg/kg	0.5	<0.5							
EP-076A-SS	Fluorene	mg/kg	0.5	<0.5							
EP-076A-SS	Phenanthrene	mg/kg	0.5	<0.5							
EP-076A-SS	Anthracene	mg/kg	0.5	<0.5							
EP-076A-SS	Fluoranthene	mg/kg	0.5	<0.5							
EP-076A-SS	Pyrene	mg/kg	0.5	<0.5							
EP-076A-SS	Benz(a)anthracene	mg/kg	0.5	<0.5							
EP-076A-SS	Chrysene	mg/kg	0.5	<0.5							
EP-076A-SS	Benzo(b)fluoranthene	mg/kg	0.5	<0.5							
EP-076A-SS	Benzo(k)fluoranthene	mg/kg	0.5	<0.5							
EP-076A-SS	Benzo(a)pyrene	mg/kg	0.5	<0.5							
EP-076A-SS	Indeno(1,2,3,cd)pyrene	mg/kg	0.5	<0.5							
EP-076A-SS	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5							
EP-076A-SS	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5							
EP-076S-SS	SURROGATE COMPOUNDS										
EP-076S-SS	2-Fluorobiphenyl	%	1	87							
EP-076S-SS	Anthracene-d10	%	1	104							
EP-076S-SS	p-Terphenyl-d14	%	1	105							

Batch: ES31740
Sub Batch: 3
Date of Issue: 31/01/2002
Client: COFFEY GEOSCIENCES PTY LTD
Client Reference: E12591/1

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION								
		Laboratory I.D.		1	1	1	3	100	101	102		
		Date Sampled		24/01/2002	24/01/2002	24/01/2002	24/01/2002	25/01/2002	25/01/2002	25/01/2002		
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	TP2_0.1-0.35_MS	TP2_0.1-0.35_MSD	TP2_0.1-0.35_CHK	TP3_0.25-0.45_CHK	METHOD BLANK1	NEPO76S445 SCS	NEPO76S445 DCS		
				CHECKS AND SPIKES								
EA-055	Moisture Content (dried @ 103°C)	%	0.1	---	---	16.7	4.3	---	---	---		
EP-076A-SS	POLYNUCLEAR AROMATIC HYDROCARBONS											
EP-076A-SS	Naphthalene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	90.5%	88.7%		
EP-076A-SS	Acenaphthylene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	88.5%	87.0%		
EP-076A-SS	Acenaphthene	mg/kg	0.5	103%	98.9%	<0.5	<0.5	<0.5	95.3%	92.5%		
EP-076A-SS	Fluorene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	91.1%	88.7%		
EP-076A-SS	Phenanthrene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	92.0%	85.9%		
EP-076A-SS	Anthracene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	92.5%	87.0%		
EP-076A-SS	Fluoranthene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	90.0%	88.4%		
EP-076A-SS	Pyrene	mg/kg	0.5	80.2%	79.7%	<0.5	<0.5	<0.5	95.8%	93.7%		
EP-076A-SS	Benz(a)anthracene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	89.5%	85.1%		
EP-076A-SS	Chrysene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	90.4%	91.0%		
EP-076A-SS	Benzo(b)fluoranthene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	92.6%	88.8%		
EP-076A-SS	Benzo(k)fluoranthene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	94.0%	94.7%		
EP-076A-SS	Benzo(a)pyrene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	91.5%	90.3%		
EP-076A-SS	Indeno(1.2.3.cd)pyrene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	87.9%	86.6%		
EP-076A-SS	Dibenz(a.h)anthracene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	87.6%	86.5%		
EP-076A-SS	Benzo(g.h.i)perylene	mg/kg	0.5	---	---	<0.5	<0.5	<0.5	88.9%	87.4%		
EP-076S-SS	SURROGATE COMPOUNDS											
EP-076S-SS	2-Fluorobiphenyl	%	1	106	113	95	86	91	93	93		
EP-076S-SS	Anthracene-d10	%	1	92	100	110	105	117	95	96		
EP-076S-SS	p-Terphenyl-d14	%	1	100	97	110	96	127	110	107		

ALS Environmental

ORGANICS QUALITY CONTROL REPORT

BATCH NO: ES31740

DATE BATCH RECEIVED: 25/01/02

CLIENT: Coffey Geosciences Pty Ltd

DATE BATCH COMPLETED: 31/01/02

PROJECT: E12591/1

Method Code	Test	Matrix	Method Reference		QC Lot Number	Date Samples Extracted	Date Samples Analysed
			Extraction	Analysis			
EP-071	TPH(SV)	Soil	Tumbler	USEPA 8015A	NTPHT3083	29/01/02	30/01/02
EP-071/80	TPH(V)/BTEX	Soil	USEPA 5030A	USEPA 8260A	NVOCS3083	29/01/02	30/01/02
EP-076	PAH (USEPA	Soil	Tumbler	USEPA 8270C	NEP076S-445	29/01/02	

Where applicable, internal standards are added to sample extracts prior to instrumental analysis. Absolute peak areas and retention times fall within the criteria specified in the individual methods. Continuing Calibration (CC) standards are run at the frequency of 1 in every 20 samples.

Abbreviations: SV = semivolatile, V = volatile

*: In-house methods

BATCH QUALITY CONTROL : CONTROL SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOCS3083
Semivol QC Lot : NTPHT3083

MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
C6-C9	2.0	<LOR	20	20.4	20.4	102	0	90	108	20
C10-C14	25	<LOR	200	190	190	95	0	79	117	20
C15-C28	50	<LOR	200	200	200	100	0	83	115	20
C29-C36	50	<LOR	200	204	200	101	2	82	130	20

COMMENTS:

1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
2) * : Recovery or RPD falls outside the recommended control limit.
3) MDL = Method Detection Limit
4) LOR = Level Of Reporting

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOC53083 MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
Benzene	0.1	<LOR	1.0	0.97	1.01	99	4	83	115	20
Toluene	0.1	<LOR	1.0	0.96	1.01	98	5	86	113	20
Chlorobenzene	0.1	<LOR	1.0	0.98	1.02	100	3	89	112	20
Ethylbenzene	0.1	<LOR	1.0	1.01	1.02	101	1	86	114	20
m- & p-Xylene	0.1	<LOR	1.0	1.00	1.00	100	0	80	116	20
o-Xylene	0.1	<LOR	1.0	1.00	1.01	100	2	85	115	20

COMMENTS :

1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
2) ' : Recovery or RPD falls outside the recommended control limit.
3) MDL = Method Detection Limit
4) LOR = Level Of Reporting

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOCS3083
Semivol QC Lot : NTPHT3083

SPIKED SAMPLE ES31674-7
MATRIX : SOIL

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
C6-C9	<LOR	10	8.9	8.9	89	0	20
C10-C14	<LOR	430	396	380	90	4	20
C15-C28	<LOR	1570	1510	1384	92	9	20
C29-C36	<LOR	N/A	--	--	--	--	--

COMMENTS :

1) LOR: level of reporting

2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)

3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOCS3083

SPIKED SAMPLE : ES31674-7
MATRIX : SOIL

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
Benzene	<LOR	2.5	2.6	2.7	105	5	20
Toluene	<LOR	2.5	2.1	2.2	87	3	20
Chlorobenzene	<LOR	2.5	2.4	2.5	99	4	20

COMMENTS :

1) LOR: level of reporting

2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)

3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL - DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

SEMIVOLATILES QC LOT NO.: NTPHT3083 ANALYST: ALICE TAT
VOLATILES QC LOT No.: NVOCS3083 MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES31674 7	ES31674 7DUP	RPD
	mg/kg	mg/kg	%
C 6-C 9	<LOR	<LOR	--
C10-C14	<LOR	<LOR	--
C15-C28	<LOR	<LOR	--
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOCS3083 Analyst : R.CAVANAUGH
MATRIX Soil

	QC DUPLICATE RESULTS		
COMPOUND	ES31674 7	ES31674 7DUP	RPD
	mg/kg	mg/kg	%
Benzene	<LOR	<LOR	--
Toluene	<LOR	<LOR	--
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	<LOR	<LOR	--
m- & p-Xylene	<LOR	<LOR	--
o-Xylene	<LOR	<LOR	--

BATCH QUALITY CONTROL - DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

SEMIVOLATILES QC LOT NO.: NTPHT3083
VOLATILES QC LOT No.: NVOCS3083

ANALYST: ALICE TAT
MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES31674 8	ES31674 8DUP	RPD
	mg/kg	mg/kg	%
C 6-C 9	<LOR	<LOR	--
C10-C14	<LOR	<LOR	--
C15-C28	<LOR	<LOR	--
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL - DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No NVOCS3083 Analyst : H.CAVANAUGH
MATRIX Soil

	QC DUPLICATE RESULTS		
COMPOUND	ES31674 8	ES31674 8DUP	RPD
	mg/kg	mg/kg	%
Benzene	<LOR	<LOR	--
Toluene	<LOR	<LOR	--
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	<LOR	<LOR	--
m- & p-Xylene	<LOR	<LOR	--
o-Xylene	<LOR	<LOR	--

BATCH QUALITY CONTROL – CONTROL SPIKE/DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No.: NEP076S-445 ANALYST THAIR WALI

MATRIX: Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP-076A : Polynuclear Aromatic Hydrocarbons									
Naphthalene	<0.25	4.0	90.5	88.7	89.6	2.01	86.5	127	0 - 20
Acenaphthylene	<0.25	4.0	88.5	87	87.8	1.71	76.6	130	0 - 20
Acenaphthene	<0.25	4.0	95.3	92.5	93.9	2.98	86.5	128	0 - 20
Fluorene	<0.25	4.0	91.1	88.7	89.9	2.67	89	131	0 - 20
Phenanthrene	<0.25	4.0	92	85.9	89	6.86	88.7	120	0 - 20
Anthracene	<0.25	4.0	92.5	87	89.8	6.13	87.3	120	0 - 20
Fluoranthene	<0.25	4.0	90	88.4	89.2	1.79	88.6	126	0 - 20
Pyrene	<0.25	4.0	95.8	93.7	94.8	2.22	84.2	130	0 - 20
Benzo(a)anthracene	<0.25	4.0	89.5	85.1	87.3	5.04	80	135	0 - 20
Chrysene	<0.25	4.0	90.4	91	90.7	0.66	89.6	116	0 - 20
Benzo(b)fluoranthene	<0.25	4.0	92.6	88.8	90.7	4.19	84.6	132	0 - 20
Benzo(k)fluoranthene	<0.25	4.0	94	94.7	94.4	0.74	80.6	118	0 - 20
Benzo(a)pyrene	<0.25	4.0	91.5	90.3	90.9	1.32	82	125	0 - 20
Indeno(1.2.4.cd)pyrene	<0.25	4.0	87.9	86.8	87.4	1.26	58.4	138	0 - 20
Dibenzo(a.h)anthracene	<0.25	4.0	87.8	86.5	87.2	1.49	59.9	139	0 - 20
Benzo(g.h.i)perylene	<0.25	4.0	88.9	87.4	88.2	1.7	54.8	139	0 - 20
EP-076S : PAH Surrogates									
2-Fluorobiphenyl	90.5%	4.0	93.2	92.9	93.1	0.32	74.8	126	0 - 20
Anthracene-d10	117%	4.0	95.4	95.5	95.5	0.11	89.3	121	0 - 20
4-Terphenyl-d14	127%	4.0	110	107	109	2.76	91.9	125	0 - 20

COMMENTS:

1) The recovery control limits are based on ALS laboratory statistical data. (Method QWI-ORG/07)

2) The control limits on RPD (relative percent deviation) are fixed.

3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL - DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No. : NEP076S-445
MATRIX : Soils
ANALYST: THAIR WALI

COMPOUND	LOR	QC DUPLICATE RESULTS ES31740 1	ES31740 10	RPD	
				RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-076A : Polynuclear Aromatic Hydrocarbons					
Naphthalene	0.25	<0.25	<0.25	n/a	
Acenaphthylene	0.25	<0.25	<0.25	n/a	
Acenaphthene	0.25	<0.25	<0.25	n/a	
Fluorene	0.25	<0.25	<0.25	n/a	
Phenanthrene	0.25	<0.25	<0.25	n/a	
Anthracene	0.25	<0.25	<0.25	n/a	
Fluoranthene	0.25	<0.25	<0.25	n/a	
Pyrene	0.25	<0.25	<0.25	n/a	
Benzo(a)anthracene	0.25	<0.25	<0.25	n/a	
Chrysene	0.25	<0.25	<0.25	n/a	
Benzo(b)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(k)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(a)pyrene	0.25	<0.25	<0.25	n/a	
Indeno(1.2.4.cd)pyrene	0.25	<0.25	<0.25	n/a	
Dibenzo(a,h)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(g,h,i)perylene	0.25	<0.25	<0.25	n/a	
EP-076S : PAH Surrogates					
2-Fluorobiphenyl	1%	80.3%	95%	16.8	0 - 20
Anthracene-d10	1%	104%	110%	5.61	0 - 20
4-Terphenyl-d14	1%	96.9%	110%	12.7	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL : DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No. : NEP076S-445
MATRIX : Soils
ANALYST: THAIR WALI

COMPOUND	LOR	QC DUPLICATE RESULTS ES31740 3	ES31740 3D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-076A : Polynuclear Aromatic Hydrocarbons					
Naphthalene	0.25	<0.25	<0.25	n/a	
Acenaphthylene	0.25	<0.25	<0.25	n/a	
Acenaphthene	0.25	<0.25	<0.25	n/a	
Fluorene	0.25	<0.25	<0.25	n/a	
Phenanthrene	0.25	<0.25	<0.25	n/a	
Anthracene	0.25	<0.25	<0.25	n/a	
Fluoranthene	0.25	<0.25	<0.25	n/a	
Pyrene	0.25	<0.25	<0.25	n/a	
Benzo(a)anthracene	0.25	<0.25	<0.25	n/a	
Chrysene	0.25	<0.25	<0.25	n/a	
Benzo(b)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(k)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(a)pyrene	0.25	<0.25	<0.25	n/a	
Indeno(1.2.4.cd)pyrene	0.25	<0.25	<0.25	n/a	
Dibenzo(a.h)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(g.h.i)perylene	0.25	<0.25	<0.25	n/a	
EP-076S : PAH Surrogates					
2-Fluorobiphenyl	1%	74.6%	85.5%	13.6	0 - 20
Anthracene-d10	1%	112%	105%	6.45	0 - 20
4-Terphenyl-d14	1%	93.2%	95.7%	2.65	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL – MATRIX SPIKE/DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No. : NEP076S-445 ANALYST : THAIR WALI

MATRIX: Soils Sample ID: ES31740-1

COMPOUND	Sample Results	Spike Level	SPIKE QC RESULTS				Conf. Limit
			MS Rec.	MSD Rec.	Average Rec.	RPD	RPD
	mg/kg	mg/kg	%	%	%	%	%
EP-076A : Polynuclear Aromatic Hydrocarbons							
Acenaphthene	<0.25	10	103	98.9	101	4.06	0 - 35
Pyrene	<0.25	10	80.2	79.7	80	0.625	0 - 35
EP-076S : PAH Surrogates							
2-Fluorobiphenyl	80.3%	4	105	113	109	7.34	0 - 35
Anthracene-d10	104%	4	92.4	99.5	96	7.4	0 - 35
4-Terphenyl-d14	96.9%	4	99.7	97	98.4	2.75	0 - 35

COMMENTS:

1) The RPD control limits are fixed.

2) *: RPD falls outside the recommended control limit.

APPENDIX E

QA/QC DATA VALIDATION REPORT

Coffey

Coffey Geosciences Pty Ltd

A.C.N. 056 335 516

Environmental Division

QA/QC DATA VALIDATION REPORT

Job No: E12591/1 ALS Batch: ES31740

I. SAMPLE HANDLING

	Yes	No (Comment below)
1. Were the sample holding times met?	✓	☐
2. Were the samples in proper custody between the field and reaching the laboratory?	✓	☐
3. Were the samples properly and adequately preserved? *This includes keeping the samples chilled, where applicable.*	✓	☐
4. Were the samples received by the laboratory in good condition?	✓	☐

COMMENTS:

Sample handling was:	✓ Satisfactory	☐ Unsatisfactory
	☐ Partially Satisfactory	

II PRECISION/ACCURACY ASSESSMENT

	Yes	No (Comment below)
1. Was a NATA registered laboratory used?	✓	☐
2. Did the laboratory perform the requested tests?	✓	☐
3. Were the laboratory methods adopted NATA endorsed?	✓	☐
4. Were the appropriate test procedures followed?	✓	☐
5. Were the reporting limits satisfactory?	✓	☐
6. Was the NATA Seal on the reports?	✓	☐
7. Were the reports signed by an authorised person?	✓	☐

COMMENTS:

Precision/Accuracy of the Laboratory Report:	✓ Satisfactory	☐ Unsatisfactory
	☐ Partially Satisfactory	

III. FIELD QA/QC

1. Number of Samples analysed — Soil: 29; Water: 0
2. Number of Days of Sampling: — Soil: 1; Water: N/A
3. Number and Type of QA/QC Samples Collected:

	SOIL	WATER
Field Duplicates	3	N/A
Trip Blanks	0	N/A
Wash Blanks	1	N/A
Other (Field Blanks, Spiked Trip Blanks, etc.)	0	N/A

4. FIELD DUPLICATES

	Yes	No (Comment below)
A. Were an Adequate Number of field duplicates collected?	✓	☐
B. Were RPDs within Control Limits?		
a. Organics (± 50%)	✓	☐
b. Metals/Inorganics (± 50%)	✓	☐

COMMENTS:

The RPDs for chromium (57%) and lead (67%) for the TP10/TP10A duplicate pair marginally exceeded the control limit of 50%. However taking into account that the concentrations of chromium and lead were less than five times the detection limit, this is not considered to affect the useability of the data.

The heavy metal RPDs were within control limits for the TP4/TP4A and TP8/TP8A duplicate pairs.

III. FIELD QA/QC (Continued)

5. TRIP BLANKS

	Yes	No (Comment below)
A. Were an Adequate Number of trip blanks collected?	✓	☐
B. Were the Trip Blanks free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals.)	✓	☐

COMMENTS:

No trip blank was collected. However, as no BTEX or TPH C6-C9 was detected in the samples analysed, introduction of volatile organics was considered unlikely to have occurred.

No trip spike was collected. As samples were chilled when received by the laboratory and were analysed within holding times, opportunity for loss of volatiles is considered to be low.

6. WASH BLANKS

	Yes	No (Comment below)
A. Were an adequate number of Wash Blanks collected?	✓	☐
B. Were the Wash Blanks free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals.)		✓

COMMENTS:

Zinc was detected at a low concentration (2ug/L) in the wash blank. This may be the result of small quantities of lead contaminated soil remaining on the sampling equipment following decontamination. However, at this concentration, the likelihood of introduction of significant lead to a soil sample resulting from cross contamination is considered to be low.

The field QA/QC was:	✓ Satisfactory	☐ Unsatisfactory	☐ Partially Satisfactory

IV LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

1. Type and Number of QA/QC Samples

	Metals	PAH	TPH	BTEX
Laboratory Blanks/Reagent Blanks	1	1	1	1
Matrix Spikes/Matrix Spike Duplicates	1	2	1	1
Standard/Certified Reference Material Analysis	2	1	1	1
Laboratory Duplicates	4	2	0	0
Surrogates	0	18	11	11

	Yes	No (Comment below)
2 Were the laboratory blanks/reagents blanks free of contamination?	✓	☐
3. Were the reference material / spike recoveries within control limits?		
a. Organics (60% to 120%)	✓	☐
b. Metals/Inorganic (70% to 130%)	✓	☐
4. Were the RPDs of the laboratory duplicates within control limits?	✓	☐
5. Were the surrogate recoveries within control limits?	✓	☐

COMMENTS:

The laboratory internal QA/QC was: ✓ Satisfactory ☐ Unsatisfactory ☐ Partially Satisfactory

V. DATA USABILITY

1.	Data Directly Usable	✓
2.	Data Usable with the following qualification (see comment below)	☐
3.	Data Not Usable.	☐

COMMENTS:

QA/QC Report Prepared by Joshua Lasky

QA/QC Report Reviewed by: _____

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